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Experiments on Contagious Abortion

I.—The Infectivity of Br. abortus Strain 45 for Cattle.
II.—Field Immunisation Experiments with a Vaccine prepared from Strain 45.

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It has been shown that the resistance of guinea-pigs to *Br. abortus* infection was increased by vaccinating the animals with a living culture of *Br. abortus* strain 45. This strain disappeared rapidly from guinea-pigs' tissues even after the inoculation of very large numbers of micro-organisms (McEwen and Roberts, 1936).

In view of these results experiments were undertaken on cattle. The first part of this paper deals with the infectivity of strain 45 for cattle and the second part is concerned with field vaccination trails, the vaccine consisting of a living culture of strain 45.

The methods of preparing suspensions of strain 45, the preparation of vaccine, the manner of conducting agglutination tests and of culturing material for *Br. abortus* were similar to those described in the previous paper, but when milk samples and foetal membranes were submitted to cultural tests fuchsin agar was used and in some cases the malachite green and gentian violet agar of Stockmayer (1933) was also employed. Throughout the experiments the suspensions of *Br. abortus* used for agglutination tests were similar as regards agglutinability. During the course of all the experiments strain 45 remained smooth, and fully agglutinable. The cultures from which each batch of vaccine was made were tested, before the vaccine was used, for heat stability according to the method of Pandit and Wilson (1932).

PART I

THE INFECTIVITY OF BR. ABORTUS STRAIN 45 FOR CATTLE

The preliminary experiments were carried out on animals which were members of an infected herd and although these animals showed no agglutinins at titres of 1 : 10 and upwards before inoculation, their freedom from infection with *Br. abortus* could not be guaranteed. Furthermore, after inoculation those animals which were kept in the milking herd were exposed to a risk of infection from naturally infected animals, and the trials were therefore less critical than they would have been had the animals been members of a non-infected herd. Nevertheless they indicated that the subcutaneous inoculation of strain 45 did not cause a uterine infection and with this information field vaccination experiments were started. A more critical test, in which ten heifers from an abortion tested herd where no fresh reactor had appeared for four-and-a-half years were used, was carried out later. This test confirmed the evidence that *Br. abortus* strain 45 was innocuous when inoculated subcutaneously into pregnant non-infected cattle.

Particulars of the experiments on the infectivity of the strain for cattle are given in Tables I, II, III and IV and in the following notes.

Notes on Table I (overleaf)

The only animal, No. 9, which was shown to be infected was a cow which had been in the herd for some time before she was inoculated and a CO_2-sensitive strain of *Br. abortus* was recovered from the milk before she calved, indicating that she was infected with a field strain and not with the aerobic vaccine strain. Unfortunately only one guinea-pig, inoculated with material from the foetal membranes of this cow, survived to be examined for *Br. abortus* infection. When this animal was killed its serum reacted positively to the agglutination test but media sown out with spleen tissue became contaminated by a spreading growth and *Br. abortus* was not recovered.

Animals 14 and 15 are interesting as they were heifers carrying their first calf when inoculated with a single massive dose of culture and both calved normally and the low titre of their serum suggested that neither was infected.

THE INTRAVENOUS INOCULATION OF STRAIN 45

In the first test two pregnant heifers Nos. 16 and 17, the one in the sixth and the other in the seventh month of pregnancy, were each inoculated intravenously with approximately 4,000 million bacteria. Both heifers calved normally, but the membranes were not received for examination. The serum from one animal showed a titre of 1 : 1,280 shortly after calving, the serum from the other animal was not tested, but no agglutinins were found in her milk.

The Subcutaneous Inoculation of Strain 45

TABLE I

The subcutaneous inoculation of strain 45 into non-reacting animals in a herd which contained a number of naturally infected cows.

No. of Animal.	Description.	No. of Inoculations of Vaccine before Service.	No. of Inoculations of Vaccine after Service.	Time before Date of Calving when last Inoculation was given.	Approximate No. of Bacteria in each Inoculation.	Maximum Titre of Serum before Calving.	Titre after Calving	Titre 6 months after Calving.	Titre 1 year after Calving.	Titre 2 years afte Calving.	Remarks.
1	1st clf. hfr.	5	3	3 months	$3{,}000 \times 10^6$	1 : 160					Cd. N. Material from membranes inoculated into guinea pigs. Animals free from infection when killed.
2	„	5	3	4½ „	„	1 : 320					Cd. N. Membranes not received.
3	„	4	4	3 „	„	1 : 1,280	1 : 2,560	1 : 640	1 : 80	1 : 80	Cd. N. Material from membranes inoculated into guinea-pigs. Animals not infected.
4	„	3	4	4½ „	„	1 : 160	1 : 80	1 : 160	1 : 80	1 : 80	Cd. N. Membranes not received.
5	„	3	4	4 „	„	1 : 80	1 : 80	1 : 40	1 : 40	1 : 10	Cd. N. Membranes inoculated into guinea-pigs. Animals not infected.
6	„	3	4	3 „	„	1 : 320	1 : 640	1 : 640			Cd. N. Membranes not received.
7	„	3	4	5½ „	„	1 : 80		1 : 40			Cd. N. Membranes not received.
8	Cow	3	3	3 „	„	1 : 160		1 : 80			Cd. N. Membranes not received.
9	„	3	3	3 „	„	1 : 640	1 : 1,280	1 : 320		1 : 320	Cd. N. Membranes inoculated into guinea-pigs. Animals infected. A CO_2 sensitive strain of *Br. abortus* isolated from milk before calving.
10	1st clf. hfr.	3	3	5 „	„	1 : 160		1 : 160	1 : 80	1 : 20	Cd. N. Membranes not received.
11	„	2	3	4 „	„	1 : 80	1 : 160	1 : 40	1 : 20		Cd. N. Membranes inoculated into guinea-pigs. Animals not infected.
12	„	2	3	2 „	„	1 : 160	1 : 320	1 : 80	1 : 80		Cd. N. Membranes inoculated into guinea-pigs. Animals not infected.
13	„	0	3	2½ „	„	1 : 80		1 : 80	1 : 20		Cd. N. Membranes not received.
14	Hfr. pregnant for 1st time	0	1	4 „	$600{,}000 \times 10^6$		1 : 20				Cd. N. Membranes not received.
15	„	0	1	4 „	„		1 : 160				Cd. N. Cultures from membranes showed no *Br.abortus*.

Cd. = calved ; N. = normally ; clf. = calf ; hfr. = heifer.

TABLE II

The intravenous inoculation of pregnant heifers each with approximately 600,000 million bacteria of strain 45

No. of Animal.	Condition.	Result.	Remarks.
18	5 months pregnant	Aborted, 20 days premature	Foetal membranes showed typical lesions of a *Br. abortus* infection. Large numbers of *Br. abortus* present in smears from contents of foetal stomach but cultures from same proved non-pathogenic for guinea-pigs.
19	5 months pregnant	Aborted, 65 days premature	Similar to those of Animal No. 18.
20	5 months pregnant	Calved 14 days prematurely but calf vigorous	The foetal membranes were examined and a few of the cotyledons were found to be showing a peripheral necrosis and smears from these areas showed numbers of *Br. abortus*. Material from the cotyledons was inoculated into guinea-pigs but did not produce infection.

The intravenous inoculation of larger numbers of bacteria was now tested and the results are summarised in Table II.

Notes on Animals in Table II

The serum from No. 18 agglutinated at 1 : 640 two days after her abortion; higher dilutions of serum were not tested, but 41 days later the titre was only 1 : 80.

The serum from No. 19 reacted at a titre of 1 : 320 two days after abortion but 96 days after abortion it gave a titre of 1 : 160.

The serum from No. 20 was not tested until 42 days after calving when it showed a titre of 1 : 160.

Gravity cream from the milk from No. 18 collected 17 days after her abortion was inoculated in 3 c.c. amounts into guinea-pigs. The gravity cream-like material from the colostrum from No. 19 was inoculated into guinea-pigs, each animal receiving 3 c.c. amounts. In no case was any inoculated guinea-pig found infected with *Br. abortus* when killed later.

Two guinea-pigs were each inoculated with approximately 5,000 million living bacteria from a culture from the foetus from No. 19, and ten guinea-pigs were each inoculated with approximately the same number of living bacteria from a culture from the foetus from No. 18. Furthermore, two other guinea-pigs received much larger inoculations of the latter culture. When these guinea-pigs were killed five to seven weeks after inoculation none was found infected with *Br. abortus*, media inoculated with material from their spleens remaining sterile. Their sera, however, reacted at titres of 1 : 20 to 1 : 80.

As the strain isolated from Nos. 18 and 19 was aerobic, non-pathogenic for guinea-pigs and stimulated the appearance of agglutinins in guinea-pigs in relatively low titre, it was concluded that it was the vaccine strain. Had the strain been present in the udder of the heifers it was not to be expected that its presence could be determined by the inoculation of colostrum or cream into guinea-pigs; serological and cultural examinations were therefore made on the whey and gravity cream respectively from heifers 18, 19 and 20. These examinations are recorded in Table III and show that there was no evidence of any of the animals being infected in the udder.

It was concluded that the intravenous inoculation of very large numbers of strain 45 though causing a uterine infection in pregnant heifers did not cause an udder infection, and the low titres shown by these animals some time after aborting or calving suggest that the animals were no longer infected.

The results of the further subcutaneous inoculations of strain 45 into nine pregnant heifers and one non-pregnant heifer are given in Table IV (*overleaf*).

Material from the cotyledons was inoculated on to fuchsin agar plates and on to malachite green, gentian violet agar plates; serial dilutions were also made from the cotyledons and from the uterine swabs and the different dilutions sown on to the above media.

Notes on Heifers in Table IV

In view of the inability of the vaccine strain recovered from heifers Nos. 18, 19 and 20, to infect guinea-pigs, material from the membranes or uteri of heifers 21 to 30 and from their udders was not inoculated into guinea-pigs but submitted to cultural examination only.

The membranes were recovered from six of the ten heifers and in these cases they were normal in appearance and *Br. abortus* was not seen in smears made from the cotyledons nor was it recovered by cultural means. In four instances the heifers calved during the night and ate their membranes but material from uterine swabs sown on to media gave no growth of *Br. abortus*.

Quarter samples of colostrum from all ten heifers were cultivated but in no instance was

TABLE III

Examination of milk from heifers inoculated intravenously with strain 45

No. of Animal.	No. of Days after Abortion or Calving when Samples were taken.	Titres of Whey, Quarter Samples.				Cultivation of Quarter Samples of Gravity Cream.
		R.F.	R.H.	L.F.	L.H.	
18	1	1 : 80	1 : 160	1 : 160	1 : 160	No *Br. abortus*
	8	1 : 40	1 : 80	1 : 160	1 : 80	" "
	17	Neg.	Neg.	Neg.	Neg.	" "
	33	"	"	"	"	" "
	41	"	"	"	"	" "
	52	"	"	"	"	" "
19	62	"	"	"	"	" "
	75	"	"	"	"	" "
	84	"	"	"	"	" "
	103	"	"	"	"	" "
20	3	"	"	"	"	" "
	25	"	"	"	"	" "
	33	"	"	"	"	" "

TABLE IV

The subcutaneous inoculation of heifers, from a non-infected herd, each with approximately 36,000 million living bacteria.

No. of Animal.	Condition when Inoculated.	Titre of Serum after Inoculation.	Titre of Serum 4 months after Inoculation.	Calving.	Titre of Serum after Calving.	Titre of Colostrum Quarter Samples.	Remarks.
21	5 months pregnant	1 : 160	1 : 20	Normal	1 : 20	−1 : 10 1 : 20 −1 : 10 −1 : 10	Bacteriological examination of membranes and of colostrum negative.
22	3 months pregnant	1 : 640	1 : 40	,,	1 : 40	1 : 40 1 : 40 1 : 10 1 : 80	,, ,,
23	4 months pregnant	1 : 80	−1 : 10	,,	1 : 10	−1 : 10 −1 : 10 1 : 20 1 : 20	,, ,,
24	5 months pregnant	1 : 80	1 : 20	,,	1 : 40	1 : 160 1 : 80 1 : 80 1 : 80	,, ,,
25	3 months pregnant	1 : 320	1 : 20	,,	1 : 80	1 : 160 1 : 160 1 : 160 1 : 320	,, ,,
26	4 months pregnant	1 : 160	1 : 20	,,	1 : 20	1 : 80 1 : 80 1 : 40 1 : 20	,, ,,
27	Not pregnant	1 : 80	1 : 40	Served 4 mths. after inoculation. Calved normally	1 : 40	1 : 160 1 : 80 −1 : 10 1 : 160	Bacteriological examination of uterine swabs and of colostrum negative.
28	5 months pregnant	1 : 320	1 : 80	Normal	1 : 40	1 : 320 1 : 320 1 : 320 1 : 320	,, ,,
29	4 months pregnant	1 : 320	1 : 80	,,	1 : 80	1 : 320 1 : 640 1 : 160 1 : 320	,, ,,
30	5 months pregnant	1 : 640	1 : 160	,,	1 : 40	−1 : 10 1 : 10 −1 : 10 −1 : 10	,, ,,

Br. abortus recovered. Quarter milk samples were collected from the animals at weekly intervals until four, and in some cases five, samples were obtained and later another three and in some instances four samples were collected at longer intervals, but *Br. abortus* was not cultivated from any of these quarter samples. In no case were agglutinins demonstrated in the whey from these samples of milk, and it was concluded that in no case had strain 45 caused infection in the heifers Nos. 21 to 30.

Summary of Part I

The subcutaneous inoculation of non-infected pregnant cattle with large numbers of living *Br. abortus* strain 45, 36,000 million bacteria and more, did not cause infection of the uterus or the udder.

The intravenous inoculation of very large numbers of this strain into pregnant heifers caused uterine infection and abortion but it did not cause an udder infection and furthermore it is probable that the infection it caused

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was a transient one. The strain after recovery from an aborted foetus was still non-pathogenic for guinea-pigs. It was concluded that in view of the inability to produce an infection of the pregnant uterus and of the udder in animals inoculated subcutaneously, the inability to demonstrate any udder infection in animals inoculated intravenously and the non-pathogenicity of the strain recovered after passage through the bovine, there was no objection to using a live vaccine prepared from this strain in infected herds.

Part II

FIELD IMMUNISATION EXPERIMENTS WITH STRAIN 45

The literature on the immunisation of cattle with virulent strains of *Br. abortus* leaves little doubt that vaccinated animals are less likely to abort than controls when both groups are infected experimentally with *Br. abortus*, just as it is probable that animals which become infected before pregnancy are less likely to abort than those which first acquire infection whilst pregnant.

The objections and prejudices to vaccinating cattle with living virulent strains of *Br. abortus* are well known and in this country they have culminated in the Ministry of Health's order prohibiting the inoculation of animals in tuberculin tested herds licensed under their authority.

Vaccination during calfhood is less likely to cause an infection of the udder than vaccination later in life and if it were shown that vaccinated calves were free from infection and immune when sexual maturity was reached a means for the control of the disease would be available. There is evidence suggesting that calves inoculated with a strain of reduced virulence possess some immunity later in life, Buck (1930). The immunity gained in calfhood by the inoculation of a non-virulent culture of *Br. abortus* has not been compared with the immunity produced by similar inoculations given to mature animals, but there is no reason to suppose that the former would be the superior.

The justification for calfhood vaccination will arise when it is shown that immunity depends upon the persistence of living *Brucella abortus* in the body for a considerable period of time, and that the vaccine strain will not cause an udder infection in any of the animals.

Even if calfhood vaccination were successful its application would be limited to self-contained herds unless, indeed, the immunity were of long duration and became widely practised and farmers could purchase heifers or cows vaccinated as calves and still immune to the disease. There are, at the present time, serious practical limitations to the control of contagious abortion even by an efficient method of calfhood vaccination.

The objection to the use of living vaccine in adult animals disappears when it is shown that the vaccine is harmless for cattle and does not cause an udder infection. If a harmless vaccine were to afford some degree of protection it would be of some immediate value in limiting the spread of the disease in herds.

Cotton (1932) worked with small groups of cattle and compared the immunity of animals inoculated before pregnancy with living cultures of a non-virulent bovine strain, a porcine strain and a virulent bovine strain respectively. Those vaccinated with the virulent strain showed the greatest resistance to an experimental infection during pregnancy, but the animals inoculated with the non-virulent bovine strain were more resistant than the controls. His experiments also show that animals vaccinated during pregnancy with the non-virulent bovine strain may possess some immunity to the disease.

Cotton and Buck (1933) obtained encouraging results with three vaccines prepared from bovine strains of *Br. abortus* of different degrees of virulence, the least virulent strain being incapable of producing lesions in inoculated guinea-pigs. Three small groups of cattle were vaccinated before service each with a vaccine of a different degree of virulence. Their resistance to infection was tested during the following pregnancy and all groups showed a comparable resistance to an exposure which infected all of the animals in a control group. Later the same authors (1933) vaccinated ten pregnant cattle with a strain of low virulence and found that the animals possessed a slightly greater resistance to infection than control animals.

Huddleson (1924) reported his experiments with a strain of *Br. abortus* which was non-virulent for cattle. Later Huddleson (1929) converted this strain to a phase where it did not stimulate agglutinins in inoculated animals for normal strains of *Br. abortus* and this " rough " strain was used for a number of years in field vaccination experiments which have lately been summarised by Meyer and Huddleson (1936). In these experiments cattle giving a negative reaction to the agglutination test were vaccinated or used as controls but animals of all ages from a week upwards and of both sexes were included, apparently without differentiation, in the experiment. The numbers of animals which became infected in different years as judged by the reaction to the agglutination test show that in herds where vaccinated, control and infected animals were present 7·6 per cent. of 3,451 vaccinated animals, and 10·1 per cent. of 1,590 control animals became infected.

In a number of infected herds controls were not kept and in these herds 6·2 per cent. of 947 vaccinated animals became infected. These figures do not indicate any very definite resistance on the part of the vaccinated. A

comparison of the abortions due to *Br. abortus* infection, however, reflects more favourably on vaccination as out of 1,381 pregnancies in vaccinated animals in herds where controls and infected animals were kept, 7·6 per cent. of the pregnancies terminated in abortion but only 4·7 per cent. were attributed to Brucella infection, whereas out of 464 pregnancies in control animals 16·3 per cent. ended in abortion and 10·1 per cent. were attributed to Brucella infection. It will be observed that a higher proportion of the vaccinated animals than of the controls, were pregnant. This may mean that a greater proportion of males or of young or old stock were included in the control groups, which would probably tend to keep the percentage of infection in these groups lower as they were likely to be exposed to lesser risks of infection than the vaccinated groups containing a greater proportion of breeding animals. These results encourage the hope that vaccination even with a rough non-virulent strain of *Br. abortus* stimulates a resistance to the disease.

If a reaction to the agglutination test is used in endeavouring to interpret whether or not infection has occurred in a vaccinated animal, the use of a vaccine prepared from a rough variant which does not stimulate agglutinins for the normal smooth type makes the interpretation of the agglutination test much more simple and straightforward than would be the case where a smooth strain was inoculated. In the present series of experiments with strain 45 the smooth phase was adhered to, experiments with a rough variant being considered inadvisable unless it be shown that the immunity response to the rough form is as satisfactory as it is to the smooth.

METHODS

Vaccination was only practised in infected herds where the control of the disease by eradication was not practicable. When a herd was considered suitable for vaccination, agglutination tests were carried out on all the cows and those reacting at titres of 1 : 80 or more were regarded as infected or as having been infected and were not vaccinated. Animals reacting at titres of 1 : 10 to 1 : 40 were regarded as doubtful reactors and as such were not taken into further consideration; they have, therefore, with the exception of those given in Table V, been deleted from the records.

The non-reacting animals were vaccinated except for those which, when the owner consented and the numbers justified it, were kept as controls. Pregnant and non-pregnant animals alike were vaccinated provided the former were not due to calve within two months, and the experiments were confined entirely to cows; no males were vaccinated and no females which had not had a calf.

The dose of vaccine was fixed at 4 c.c. and it consisted of approximately 18,000 million living bacteria suspended in sterile normal saline or in sterile tap water. Vaccine was prepared as required and inoculated within two days of preparation. Tests showed that for a period greater than 48 hours there was no detectable diminution in the number of viable bacteria irrespective of whether these were suspended in saline or in tap water.

An initial course of three inoculations of vaccine was given at intervals of about two months. When animals had been pregnant for more than three months at the commencement of vaccination the three inoculations could not be given before calving, but were completed after calving. Animals which had calved after receiving the three inoculations were vaccinated once more and again after every subsequent calving but if the commencement of another pregnancy was excessively prolonged two inoculations of vaccine were given. Before any animal was revaccinated its serum was tested. In practice this resolved itself into the testing of every vaccinated animal at intervals of two months. A complete record of the titres of the vaccinated animals' sera was thus obtained at two monthly intervals. Sera from the naturally infected animals were tested approximately every six months. Short summaries of breeding histories, giving service dates, the date of completion of the last pregnancy and whether this had ended in abortion, premature or normal calving, accompanied the blood samples received from the farmers. Owners were asked to send the aborted foetuses, especially from vaccinated and control cows, to the laboratory for bacteriological examination, but unfortunately these were not always received; in such cases milk samples were generally obtained and examined by the agglutination test and by inoculating gravity cream into guinea-pigs, in order to assist in establishing a diagnosis.

When foetuses were examined, cultures were made from the stomach contents, spleen, liver and kidney tissues, these being sown out on liver agar and frequently on to blood agar or liver agar with a few drops of defibrinated horse blood added. The cultures were incubated in duplicate, one set in 10 per cent. CO_2 and the other aerobically. Only CO_2 sensitive strains of *Br. abortus* have been recovered, and the CO_2 sensitivity of the strains was verified on subcultivation. The stomach contents from the foetuses of vaccinated cows were inoculated into each of two guinea-pigs and the animals were killed and examined after an interval of one month to six weeks. The absence of any evidence of *Br. abortus* infection in the foetuses from vaccinated cows, when the cows' sera did not give the positive reaction specified below, was regarded as proof that the abortion was not due to *Br. abortus* infection. It is realised that such proof is relative and not absolute, as very occasionally *Br. abortus* may be recovered

from the membranes of an aborted foetus although *Br. abortus* cannot be demonstrated in the foetus either culturally or by guinea-pig inoculation.

When non-reacting animals in an infected herds are first vaccinated there is no assurance that all the non-reacting cows are free from infection. The difficulties frequently encountered during the first year or more in the control of the disease by systematic testing and the complete segregation of all reacting animals are well-known. Reactors may still appear and even abortions occur for several months after the removal of all reactors from the herd. Cases of latent and even active infection, therefore, may elude diagnosis for a considerable period of time. Because of the impossibility of excluding infection in non-reacting cows and the possibility of vaccinated animals acquiring infection before immunity could have developed, it was considered essential to follow vaccinated animals through the second and subsequent years as a more critical estimate of immunity was likely to be obtained after the first year.

In these experiments the appearance of agglutinins in the sera of control animals at titres of 1 : 80 and higher was regarded as evidence of infection, but in vaccinated animals with agglutinins produced as a result of vaccination the same standard could not be accepted. Experience has shown, however, that when vaccination is practised, and the serum tested not less than two months after the last inoculation of vaccine, a titre greater than 1 : 320 is seldom given, and, should a titre of 1 : 640 be shown this is not maintained for more than three to four months but drops to a lower level when vaccination stops. When vaccinated animals reacted at a titre of 1 : 640, revaccination, although it might be due, was not practised until a retest showed that the titre was declining. In vaccinated animals any titres of 1 : 640 or higher which developed subsequent to the recording of a lower titre, vaccination not having been practised in the meantime, or titres of 1 : 640 which were maintained at two consecutive two-monthly tests were regarded as positive evidence of an infection, but in the absence of maintained agglutination at high titre and of other evidence of infection, vaccinated animals were regarded as non-infected. This interpretation however was not necessarily correct in every instance, it being known that naturally infected cows may occasionally react at low titres only.

In some of the herds where these experimental trials have been made there have been very considerable movements of animals out of and into the herds. These movements were sometimes so extensive that observations on many individuals terminated in a comparatively short time and the original experiment was reduced to disappointing dimensions by the second or third year.

In the present report the results are tabulated according to the years the individual animals were followed through experiment. The first year includes all animals vaccinated; the second year those animals which had already been vaccinated for a period of twelve months, excluding any animals which became infected during the first year. Third year results were compiled in the same manner. Such a division is somewhat arbitary, but it is probable that during the first twelve months after vaccination started the majority of the vaccinated animals which might be naturally infected but not reacting, or which became infected before immunity had developed, will have been detected and eliminated from the records by the beginning of the second year. The second and subsequent years should therefore provide the more reliable information. In some of the herds not all of the animals shown in any one year were followed through the same calendar year. Animals added to the herds from time to time have been tested and the non-reactors vaccinated or allotted to a control group where the latter was kept. Accordingly those shown in the first year of vaccination will be the original members of the herd and possibly some later additions, but in no herd has the interval between the entry into the herd of the different animals referred to exceeded one calendar year.

In all of the herds the disease was active at the time vaccination was started and in none of the herds has any attempt been made, during the time vaccination has been on trial, to control the spread of the disease by hygienic measures. Of late years there has been a tendency to discourage the use of live vaccine for the control of contagious abortion and optimistic but general statements have been made regarding the value of hygienic measures in the control of contagious abortion where regular testing is not practised and strict isolation of the reacting animals is not attempted. The absence of hygienic precautions after vaccination was started, such as the isolation of aborting or infected cows for some time at and after parturition, is emphasised; animals when they aborted or had calved were not removed from the milking herds or only removed while their milk was unsuitable for addition to the bulked milk. Table V (*overleaf*) shows the status of the eight herds, which were followed for a period of two years or more, at the time vaccination was first practised in each.

Discrepancies between the total number of cows and the total number of pregnancies in Table V are due to the histories of calvings not being available for some animals. The low rate of abortion in herd No. 2 may be accounted for by the sale of some animals which had aborted a short time before the first test was made. From September, 1931, until January, 1935, an effort had been made to control the

TABLE V
History of the 8 herds prior to vaccination

No. of Herd.	No. of Cows in Herd.	No. Positive to Agglutination Test.	No. Doubtful to Agglutination Test (1 : 20–1 : 40).	No. Negative to Agglutination Test.	No. of Cows Calved Normally prior to Test.	Total No. of Cows Aborted prior to Test.	No. of Cows which had Aborted prior to Test and Reacted Positively.	No. of Cows which had Aborted prior to Test and gave a Doubtful Reaction.
1	39	12	5	20	28	11	9	1
2	77	27	8	38	71	4	3	0
3	196	59	32	105	165	23	8	4
4	40	12	9	14	27	12	10	0
5	16	5	0	11	11	5	5	0
6	62	27	17	18	44	17	12	5
7	31	5	2	24	29	2	2	0
8	40	16	8	16	26	8	5	2
	501	163	81	246	401	82	54	12

TABLE VI

Table VI shows the number of animals showing a positive reaction, excluding vaccinated or control animals, in the herds at the end of the periods during which observations have been recorded, and also the number of reacting animals which entered the herds after the commencement of the experiment and were drafted out of the herds before the completion of the periods considered.

Herd.	Positive Reactors present when Herds were first tested.		Positive Reactors excluding all Vaccinated and Control Animals entering the Herds during the course of the Observations.			Total No. of positive Animals present at termination of period. Cols. 2 and 4.
	Original number present at 1st Test.	No. at termination of Experiment.	Total No.	No. sold during course of Experiment.	No. at termination of Experiment.	
1	12	4	2	1	1	5
2	27	5	18	10	8	13
3	59	10	68	42	26	36
4	12	4	4	3	1	5
5	5	4	0	0	0	4
6	27	11	22	3	19	30
7	5	3	0	0	0	3
8	16	Figures not available.				

disease in herd No. 7 by testing and the segregation of the reactors to different buildings and pastures. The reacting and non-reacting cattle were attended to by the same men and although the reactors were sold as opportunity offered the disease was not eradicated. During the period segregation was practised 15 general herd tests were made and five reactors were found in 1932, ten in 1933 and five in 1934.

The figures given in Table VI supply evidence that during the periods under consideration there was reason to expect the spread of infection from animals maintained in the herds and in some cases from the reacting animals entering the herds during the course of the experiments.

The results of vaccination are summarised in Table VII. Animals which became infected in any one year have not been recorded in the subsequent year.

In the first year 5 per cent. of all pregnancies terminated in abortion due to *Br. abortus* infection, but during the second year only 1·4 per cent. of all pregnancies ended in abortion attributable to this infection, and although 41 pregnancies were completed during the third year there was no case of abortion.

When the total numbers of animals which aborted and were infected with *Br. abortus* and those which were regarded as becoming infected although not aborting are considered together, it is shown that during the first year 5·9 per cent. became infected and that in the course of the second year this was reduced to 1·6 per cent. and, furthermore, that no animal showed evidence of becoming infected during the third year of vaccination. In calculating these percentages the total number of vaccinated animals considered each year was the number of vaccinated animals shown in col. 2 minus those shown in col. 7.

Infected animals and animals which became positive reactors have not been followed into the next year: only one such animal which reacted four months after entering the experiment, aborted in the second year.

A compilation of the data given in Tables VII and VIII for herds Nos. 2 and 3 regarding the vaccinated and control animals which calved or aborted or were retained in the herds throughout the respective years is collected in Table IX (*page* 1594).

TABLE VII

1st Year

1 No. of Herd.	2 Total No. of Vaccinated.	3 No. Calved.	4 No. Aborted *Br. abortus* Infection.	5 No. of Abortions not due to *Br. abortus* Infection.	6 No. which did not Calve.	7 No. Sold not included in Cols. 3, 4, 5, or 6.	7 No. Sold from Cols. 3, 4, 5, or 6.	9 Total Sold.	10 No. of non-aborting Cows which became Positive Reactors (including Animals in Col. 7).
1	27	21	1	1	3	1	0	1	0
2	28	22	0	0	6	0	4	4	0
3	90	46	1	3	31	9	12	21	3
4	30	17	1	0	9	3	2	5	1
5	14	6	1	2	5	0	6	6	0
6	11	9	2	0	0	0	1	1	0
7	18	11	1	1	5	0	2	2	1
8	14	10	1	1	2	0	2	2	0
Totals	232	142	8	8	61	13	29	42	5

2nd Year

1	25	19	0	1	1	0	0	1	0
2	23	17	0	0	5	0	4	4	0
3	69	54	1	1	11	2	13	15	1
4	23	18	0	0	4	1	2	3	0
5	8	6	0	0	0	2	0	0	0
6	10	8	1	0	0	1	0	1	0
7	14	7	0	0	7	0	4	4	0
8	12	2	0	0	9	0	1	1	0
Totals	184	131	2	2	37	6	24	29	1

3rd Year

1	13	11	0	0	2	0	0	0	0
2	11	9	0	0	0	2	0	2	0
3	34	21	0	0	3	5	5	10	0
Totals	58	41	0	0	5	7	5	12	0

TABLE VIII

Herd 2. Control Animals

	Total No. of Controls.	No. Calved.	No. Aborted *Br. abortus* Infection.	No. of Abortions not due to *Br. abortus* Infection.	No. which did not Calve.	No. Sold not included in Cols. 2, 3, 4 or 5.	No. Sold from Cols. 2, 3, 4 and 5.	Total Sold.	No. of non-Aborting Cows which became Reactors.
1st Year	23	4	1	1	14	3	9	12	1
2nd ,,	11	8	2	0	1	0	3	3	0
3rd ,,	5	0	1	1	3	0	3	3	0

Herd 3

1st Year	92	25	0	8	39	14	7	21	3
2nd ,,	69	49	4	2	9	7	4	11	8
3rd ,,	29	16	2	0	3	5	3	8	4

TABLE IX

Herds Nos. 2 and 3

a

Vaccinated.		Controls.	
Total No. of Pregnancies during the 3 years.	No. of Abortions due to *Br. abortus*.	Total No. of Pregnancies during the 3 years.	No. of Abortions due to *Br. abortus*.
175	2 (1·1 per cent.)	124	10 (8 per cent.)

b

Total No. of Pregnancies during the 2nd & 3rd years.	No. of Abortions due to *Br. abortus*.	Total No. of Pregnancies during the 2nd & 3rd years.	No. of Abortions due to *Br. abortus*.
103	1 (1 per cent.)	85	9 (10 per cent.)

c

Year.	No. Vaccinated.	No. became Infected.	No. of Controls.	No. became Infected.
1st	109	4 (4 per cent.)	98	5 (5 per cent)
2nd	90	2 (2 „)	73	14 (19 „)
3rd	38	0	29	7 (24 „)

Part (*a*) of the table refers to the total number of pregnancies which occurred among the vaccinated and control animals respectively in herds Nos. 2 and 3 during a period of three years.

Part (*b*) shows the number of pregnancies among the vaccinated and control animals respectively during the second and third years of individual animals being in experiment.

Part (*c*) indicates the total incidence of fresh infection occurring among the vaccinated and control animals respectively for each consecutive year the animals were in experiment.

Discussion on Part II

If the spread of contagious abortion were more rapid and the incidence of abortions higher, field vaccination trials would be more profitable.

The relatively low infectivity of the disease is shown from data collected during the past few years from 50 herds tested at this laboratory. Information is available for 2,045 cows each with a reliable history of the termination of the pregnancy immediately before testing. The sera from 518 of the cows, approximately 25 per cent., showed agglutinins for *Br. abortus* in a titre of 1 : 80 or higher: 179 had titres of 1 : 20 to 1 : 40 and the remainder showed no agglutinins at 1 : 20. Out of 1,288 parturitions among the animals showing no agglutinins in their sera 57, or 4·5 per cent., had terminated in abortions, which presumably had not been caused by Brucella infection. Out of 518 pregnancies among animals showing titres of 1 : 80 or higher 210 had ended in abortion and 29 abortions had occurred in the group of animals with titres of 1 : 20 to 1 : 40. If 4·7 per cent. of the 239 abortions among animals showing any reaction whatsoever to the agglutination test are deducted because of abortions not caused by Brucella infection it is found that not more than 10·7 per cent. of the 2,045 pregnancies terminated in abortions which could be attributed to Brucella infection. Although this is not a high percentage it is probably as high as that which occurs throughout the country as a whole because the herds from which the information was obtained were exceptional only in so far as their owners had sought assistance for the control of the disease and were prepared to go to the trouble of having their animals bled and tested. As the animals in the 50 herds included cows of all ages it is evident that 25 per cent. of the animals reacting at titres of 1 : 80 and higher represents an accumulation of infection over a period of time greater than one year.

It is clear that it is most desirable for field vaccination experiments to be conducted on a large scale when not more but probably less than 10 per cent. of cattle may be expected to abort and when the yearly incidence of infection as judged by the appearance of agglutinins may be expected to be well below 25 per cent. Furthermore, were the occurrence of abortion the sole criterion from which information regarding vaccination treatment was deduced, the greater should be the number of animals from which observations are taken, because a considerable proportion of all abortions is not caused through Brucella infection. Thus in 50 herds one-third of the abortions fell into this category and the importance of these "non-specific" abortions is shown by the data

presented by Meyer and Huddleson (1936) for herds containing vaccinated, control and infected cattle who found them to account for 2·9 per cent. and 6·2 per cent of the abortions among the vaccinated and control animals respectively; by Buck and Creech (1925) who state that these abortions interfered with the reliability of their field tests on vaccination, and by Schroeder (1922), who commented on their importance in considering field vaccination results.

When experimental animals are under the charge of the investigator and can be treated exactly as desired in the interests of research it may be possible to furnish a definite answer to a particular question by using a relatively small number of animals. But in field trials conditions are very different and it may not always be possible even to follow exactly a definite plan of investigation. Apart from the difficulty of obtaining information and material from a large number of animals in different dairy herds long distances apart, it is difficult for a single worker on his own initiative to find the herds on which to carry out extensive field vaccination tests on contagious abortion, the more especially as a living vaccine was used for which no claims whatsoever regarding its ability to prevent abortion in cattle were made. For the investigations under consideration opportunities of obtaining herds for experiment were taken as and when they offered and the best use made of each individual herd.

Two or more years ago vaccination was started on 14 herds containing 847 cows but it has only been possible to follow animals from eight of these herds into or through a second year. Vaccination stopped for different reasons in six of the herds less than one year after the first inoculations were made. These reasons include the sale of two of the herds; in one case apathy on the part of the owner and confusion in the identity of the animals at the farm; the blaming of vaccination by one owner for a sudden drop in the milk yield six weeks after some of the animals in the herd were first vaccinated; the blaming of vaccination for alleged sterility by another owner; and in one herd the Order by the Ministry of Health prohibiting the use of live vaccine in certified tuberculin tested herds. In the instance where the drop in the milk yield occurred, investigation showed that vaccinated and non-vaccinated cows were alike affected and that in fact they were suffering from acute streptococcal mastitis. The owner who complained of sterility did so on incorrect information supplied by his cowman, and, on advice from outside, treatment for sterility was given which was followed by a number of abortions of small foetuses: some of these were received at the laboratory and found free from *Br. abortus* infection. The Ministry of Health's Order terminated all further attempts to control the disease in a herd containing 74 cows, 38 of whose sera showed agglutination at titres of 1 : 80 or higher at the first test and where many of the reacting animals had aborted.

Two of the eight herds reported on, Nos. 3 and 8, have now been sold. If data had been given for every animal, vaccinated or control, in the 14 herds and grouped according to calendar years irrespective of the length of time each animal had been in experiment, the numbers reported on would have been much larger, as not only would the animals in the six herds which dropped out of experiment in the first year have been included but so also would have been data for all of the additions to the herds during the time these were under observation. For reasons already stated, however, the data on greater numbers accumulated indiscriminately would have furnished less valuable information.

Although the number of animals from which it has been possible to present critical data is small, the results are nevertheless encouraging. In the first place, they support the evidence given in Part I of this paper that the subcutaneous inoculation of cattle with *Br. abortus* strain 45 is innocuous. Secondly, the figures in Table VII show that when all pregnancies among the vaccinated animals are considered, 2·9 per cent. of these terminated in abortions attributable to *Br. abortus* infection. But when the pregnancies completed within the first year afer vaccination are disregarded only 1·1 per cent. of the pregnancies ended in abortion due to this infection. These figures represent a relatively low rate of abortion and compare favourably with the 10 per cent. of abortions found in infected herds. If the respective criteria for infection on vaccinated and control animals be accepted it is found that during the first year of vaccination out of 219 animals 5·9 per cent. became infected but that for the combined second and third years of vaccination only 1·3 per cent. of cows became infected. These are in all probability much lower incidences of infection than those which occur yearly in comparably infected herds where no control measures are adopted.

It might be contended that this relative freedom from fresh infection, especially during the second and third years, was due to the previous elimination of susceptible animals or to a greatly diminished exposure to infection. As regards the first contention, although individual variations in susceptibility may exist, the non-reacting animal must in the majority of cases be a non-reactor in virtue of her tissues having escaped actual contact with infection, there being no reason to suppose that naturally resistant animals will be less capable of antibody production than susceptible animals. As all the vaccinated were non-reactors to the

agglutination test when they were first inoculated it is concluded that they were a representative sample of the population. Furthermore, in the two herds where controls were followed, the increasing percentage of fresh infection among these animals during the second and third years refutes the suggestion that susceptible animals had been eliminated and also indeed the possible suggestion that, with increasing age, the animals became more resistant to infection.

The possibility of a lessened spread of infection during the second and third years is more probable, but in all the herds there appeared to be ample opportunity for the spread of infection during the periods under review, as may be gathered from the numbers of infected animals in the herds, excluding vaccinated or controls given in Table VI which later became infected.

Reference to Table IX shows that in the two herds where control animals were kept abortions due to Brucella infection in the vaccinated and control groups amounted to 1·1 per cent. and 8 per cent. respectively of all pregnancies over the three years of vaccination, but during the second and third years of vaccination they amounted to 1 per cent. and 10·5 per cent. respectively. It is also seen that the incidence of fresh infection during the second and third years was relatively high among the controls but very low among the vaccinated. These results therefore strengthen the view that vaccination had exerted a controlling influence on the disease.

Summary and Conclusions, Part II

Vaccination trials have been carried out on commercial dairy herds using as a vaccine a living culture of *Br. abortus* strain 45 which is relatively non-virulent. Pregnant and non-pregnant cows were inoculated. There was no evidence that the inoculations were injurious to the cattle.

Infection in vaccinated and control animals was judged on the results of agglutination tests on blood samples, the bacteriological examination of abortion foetuses, when these could be obtained, and in other instances on bacteriological examinations of milk samples.

Br. abortus infection of the vaccinated animals fell to a negligible quantity during the second and third years of vaccination and the results are encouraging in so far as no attempts were made to control the disease by hygienic measures. In the only two herds where it was possible to follow both vaccinated and control animals, fewer abortions due to Brucella infection occurred among the vaccinated animals; furthermore, during the second and third years *Br. abortus* infection was significantly less among the vaccinated animals.

It is concluded that the results of these trials are sufficiently encouraging to justify a critical experiment on the value of the vaccine prepared from strain 45 where groups of non-infected animals are vaccinated and others left as controls, and where later the individual animals in all groups are submitted to experimental infection.

Attention has been directed to some of the difficulties in conducting satisfactory vaccination trials in commercial dairy herds.

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VETERINARY SURGEONS FROM OVERSEAS

Meeting at Edinburgh

A meeting of veterinary surgeons from overseas was held at the Royal (Dick) Veterinary College, Edinburgh, on December 7th, 1937.

A discussion took place as to the advisability of the formation of an Overseas Division of the N.V.M.A. with a view to arranging social and professional meetings of overseas members when in Great Britain.

Professor Shirlaw (Muktesar) gave an interesting description of equine encephalomyelitis as it occurs in India, and the possible relationship between "Khumri" and encephalomyelitis was discussed.

The following members were present: Messrs. W. H. Beaton (Nigeria), N. Burke (Nigeria), L. A. Brito-Babapulle (Ceylon), W. Fotheringham (Kenya), W. E. Lancaster (Malaya), K. S. Nair (India), U. F. Richardson (Uganda, ret.), J. F. Shirlaw (India). Visitors: Messrs. R. S. Narayanan (Malaya) and S. M. Khayyat (Iraq).

The Veterinary Record

December 18th, 1937.

The Centralised Service—Growing Concern

THE details of the reorganisation accompanying the formation of the new centralised veterinary service are gradually filtering through to the profession from non-professional sources. Much information is available to the consultative committee which appears to be bound, unfortunately, to secrecy during the period of consultation. We ourselves feel, however, that the time has come for the profession to be taken into the fullest confidence. Rumour and anxiety are rapidly growing within all our ranks while hope and goodwill are being rapidly lost. In the interests of our members we think it advisible that an early meeting of Council be summoned, a special meeting at which these consultations and plans may be discussed at length. It is neither wholesome nor to the advantage of the profession that disquiet should grow apace and develop perhaps along ill-informed lines. There may be, and probably is, every reason for anxiety, but let the forces of the profession be organised on a basis of reliable information. Delay may be dangerous. We urge the President to use his authority to call a special Council meeting of the Association forthwith.

In connection with the foregoing, we reproduce below the text of the note appearing in the *Farmers' Weekly*, of December 12th, to which reference is made in our correspondence columns. We regret that much of the information contained therein has not been given to the profession earlier: the Consultative Committee of the Association received these details some time ago, but was requested to regard as confidential the information hitherto withheld from publication in this journal.

"The Ministry of Agriculture have decided to defer the introduction of the State Veterinary Service, for which provision is made in the Agriculture Act, until April 1st, 1938. It had been provisionally arranged for the Service to come into operation on January 1st. The Service will play an important part in the Government's great anti-disease campaign.

"Britain is to be divided into 78 divisions, each in charge of a divisional inspector, and the divisions will be grouped into areas, each in charge of a superintending inspector.

"Laboratory facilities will be provided in each division for the examination of milk samples under the Milk and Dairies Order, and it is expected that provision will also be made for area laboratory facilities.

"The Ministry have been in communication with county and borough authorities on the staffing of the Service, which will at first employ between 300 and 350 permanent whole-time officers.

"In order to carry out the whole of the duties contemplated under the Agriculture Act, a staff of 500 will be needed. It is proposed that the staff to be appointed on April 1st should be assisted by panels of part-time veterinary surgeons, which will be reduced as the permanent staff is increased."

REFORM OF HEALTH SERVICES

B.M.A. Views on P.E.P. Report

In the course of a statement on the report on the British Health Services by Political and Economic Planning, a summary of which was given in our last issue, Dr. G. C. Anderson, Secretary of the British Medical Association, says that the report will be welcomed by the medical profession: "It represents an amount of patient inquiry and critical thought which only those who have personally examined the complex problems of health organisation can fully appreciate, while it is gratifying to the British Medical Association to find many of the policies which it has itself urged advocated by an independent body. The most important of these is the extension of the National Health Insurance system to include the dependants of insured persons, but we feel that the proposal to limit the extent of private practice would present difficulties.

"We would add, as a further argument in favour of the insurance principle as against other forms of State service, the desirability of avoiding any sharp distinction between the 'official doctor' and the 'private doctor.' Any national scheme should be clearly recognised by all as providing the same quality of medical service, irrespective of means, for every patient. For this reason we advocate the undertaking of 'Poor Law' work by private practitioners, as well as to secure continuity of treatment, whether the patient is in work or has long been unemployed.

"We welcome also the recognition that the private practitioner should be regarded as 'a specialist in diagnosis'; together with the recommendation that the National Health Insurance system should also be extended to cover specialist and laboratory services. It is only through the general practitioner that the specialist's skill can be most effectively used. On the other hand, it should be recognised that any national service is incomplete which does not make every form of specialist service available to every patient.

"Finally, we welcome the general contention of the report that the nation's health services are in need of thorough co-ordination if their piecemeal and haphazard growth is to be rectified; and the suggestion that the general practitioner should be brought into closer relationship with hospital and clinic services."

CLINICAL COMMUNICATIONS*

Strychnine Medication

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CASE 1.—The subject was a bay gelding, aged five years. The horse was unable to walk straight, and I diagnosed locomotor ataxy. As the horse was quite useless, I told the owner it was a case of "kill or cure"—probably "kill." The animal was carted in a float to my infirmary. He was so helpless in the use of his limbs that, after pushing him out of the float, it took ten men to get him into a loose box, one at the head, one at the tail and two to each limb. The limbs were moved up in order, and eventually he was with difficulty pushed into a loose box. The "Professor Macqueen treatment" was started next day, *viz.*, 1 gr. strychnine night and morning in food, for one week, and in increasing doses for successive weeks, 2 grs., 3 grs., 4 grs., 5 grs., 6 grs., 7 grs. and 8 grs. night and morning, respectively. My assistant, unknown to me, administered 9 grs. in bolus night and morning for one day, 18 grs. in the day, and another bolus containing 9 grs. next day in the morning. I went out on a short journey and, on arriving home, my groom came to take my horse out and said the horse in the stable had "got the poison." I found the horse in spasms of acute strychnine poisoning. He was mad, sweating profusely and evidently very uncomfortable. It was quite impossible to get near him as he was so erratic in his movements. I made a solution of 2 oz. chloral hydrate in a pint of water and filled an enema pump. I waited for an opportunity for him to present his hind quarters to the door of the box, when I immediately gave him the enema, and in about 15 minutes the symptoms of strychnine poisoning passed off. The horse quietened down and I put two men on to whisp him dry. He soon started to feed and appeared quite comfortable. Next day I started 1 gr. strychnine night and morning in food, continued for a week, increased to 2 grs. per day for a week, then to 3 grs. a day. From the time of the exhibition of the first poisoning symptoms the horse improved daily and I did not consider it necessary to proceed to poison him again. I continued the 3 grs. a day for some time, and eventually I sent the horse home absolutely cured. The owner sold him warranted sound for £120.

CASE 2. *Subject.*—Collie dog, with total paralysis of both hind limbs and tail. He could drag himself about on his fore limbs, but had no control of the hind limbs or of evacuations. I started treatment with one-hundredth gr. strychnine for one week, one-fiftieth for a week and one-twenty-fifth for about three days, when symptoms of strychnine poisoning appeared. I allowed the spasms to continue for about 15 minutes, when a dose of chloral hydrate was given by the mouth, when the symptoms soon passed off. A day or two after there was an improvement in the use of the hind legs. This procedure was repeated: if I remember rightly, I caused symptoms of poisoning to occur four times. The dog recovered to such an extent that he could follow his master on his bicycle, and no one, not knowing that he had been paralysed, would have noticed anything wrong with him.

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Two Cases of Obstruction by Twigs

T. G. HEATLEY, O.B.E., M.R.C.V.S
WOODBRIDGE

A client, having had three cases of actinobacillosis of the tongue make good recoveries after treatment, wrote and asked for medicine for another cow affected. When he was giving the first dose he found a piece of sedge and a piece of twig sticking under the tongue. The sedge he removed, but reported that he could not shift the twig: as this sounded somewhat strange I took an extra strong forceps with me. The cow was much swollen between the jaw bones, and she had a particularly worried look.

On opening the mouth, I seized the twig with the strong forceps, and while withdrawing it, I got the impression that there was some laceration going on, which was explained by finding that the twig was blackberry, 11 in. long, and the hooks of the thorns were directed towards the teeth. I gave a mouth wash, and expected the formation of an abscess below the tongue, but after 36 hours she was eating again and appeared quite normal.

When I had her mouth open I noticed some grass, which I started to clear away. I found, however, that it was a very solid mass situated between the tongue and the palate, about 3 in. vertically opposite the teeth and sloping off backwards for seven or eight inches towards the back of the throat. This mass of grass had forced the tongue downwards between the jaw bones and caused the swelling. The twig had prevented deglutition but had not prevented the cow accumulating grass in her mouth.

CASE 2.—In the autumn of 1914 there were a number of mounted troops stationed round Woodbridge, and, as usually happens, there were numerous cases of infectious colds and strangles, which spread to the farms in the

*Cases presented at a meeting of the Eastern Counties Division, N.V.M.A., held at Ipswich, October 8th, 1937.

neighbourhood. One stud was rather extensively affected with strangles and one day I was asked to look at a four-year-old stallion, off colour and supposed to be developing strangles. I took his temperature, which was normal, but round the throat he was sore to the touch. Therefore I put my hand in his mouth and fancied I could feel a foreign body at the back of the throat. As I luckily had the hobbles with me, and the stud groom had a balling iron, I put the horse down and found that the foreign body was a catapult-shaped twig out of the fence; the handle was in his gullet and one part of the crotch was at the top side of the soft palate and the other projected into his mouth, so that he could not swallow it owing to the width of the crotch and he could not cough it up because the soft palate was in the crotch. With a little manipulation I removed it.

* * * * *

An Unusual Case of Urethral Obstruction

T. G. HEATLEY, O.B.E., M.R.C.V.S
WOODBRIDGE

A good many years ago, before cars were in general use, I was asked to see a valuable horse foal a few days old, in violent pain. This case was ten miles from my home. I found the foal had stoppage of urine, and drove back home to get a foal catheter, and hired a car to hasten things.

I found the urethra was obstructed half-way up the protrusible part of the penis. By this time the foal was getting *in extremis*, so, using a Symes abscess knife, as quickly as possible I cut down on to the obstruction. The skin was rather loose and naturally the hole on the outside was small, so that when I opened the urethra there was a great rush of urine, which could not escape quickly enough through the outside hole; the escaping urine infiltrated the cavernous tissue surrounding the urethra, and the penis was so distended that I had to puncture it in several places to get an outlet for the urine under the skin. The obstruction was pretty firm and was described as being composed of epithelial cells and inspissated mucus. The foal made a good recovery.

The after-history of this foal was interesting. He was saved as a stallion and at three years old some Russian buyers liked him very much, but would not buy him as he had rather a large splint. He was therefore put to the stud, but with the first mare to which he was mated it was found that his penis bent downwards, so that copulation was impossible, due, no doubt, to the injury to his penis as a foal. The horse was therefore castrated and then was sold as a four-year-old to a brewery for town work for £90.

ABSTRACTS

[Memorandum on the Banffshire Grass Disease Investigation. McKAY, W. M.]

In this memorandum Mr. W. M. McKay, M.R.C.V.S., reports the results of enquiries and investigations carried out by a Veterinary Sub-Committee of the County Council of Banffshire in 1936. The work embraced (*a*) the analysing of replies to a questionnaire sent to all farmers in the county; (*b*) the feeding of certain minerals with a view to preventing the disease; (*c*) the carrying out of various treatments with a view to curing affected horses; (*d*) the examination of blood and tissues of actual cases.

Various tables are given showing the kinds of grasses, manures and fertilisers used and the types of feeding of the horses on the farms on which grass disease is present or absent. There seems to be no significant difference. Hemlock was not found in the county.

The preventive treatment consisted in the feeding of a mineral mixture containing 80 parts calcium carbonate and 20 parts kaolin. In all, 640 horses were given the mixture. No controls were kept, but because of past experience it was anticipated that the number of deaths from grass disease would be 20 to 30 horses. A table is given in which it is shown that 16 of the treated horses died. Of these nine are attributed to typical grass disease, three more were probably also cases, but the author does not accept that the remaining four were affected with grass disease. From the result of this experiment the author finds it difficult to say whether the reduction in mortality is statistically significant, but notes that the incidence of the disease in the group was certainly below expectation.

Several methods of treatment of affected animals were adopted and varied from stomach drainage and lavage to injections of normal saline, calcium, pituitrin and *Cl. welchii* "D" antiserum. No treatment gave entirely satisfactory results, though it is reported that distinct improvement followed the intravenous injection of calcium and magnesium together with stomach lavage and the introduction of calcium chloride by stomach tube and the administration of cardiac stimulants. Unfortunately the improvement did not prove to be permanent.

Examination of the blood of affected horses was carried out in some cases. It was noted that coagulation took place very slowly and in some cases practically not at all. There was usually an increase in serum proteins and the serum calcium was usually low; but the level of serum phosphatase remained normal.

On discussing the cause of grass sickness the author refers to bacteria and dismisses them for

several reasons, including the inability to reproduce the disease and the failure to confer immunity using bacteria and their products. He further states that one attack does not confer immunity nor resistance to a further attack.

Attention is drawn to the marked distension of the stomach, which was found to contain usually four to six gallons of fluid, and to the marked splenic congestion together with "collapse of the heart." In these connections the author states: "The secretion of a large amount of fluid at the expense of the blood plasma into the stomach and small intestine appears to be the essential feature of the disease"; and "In view of the fact that there is blood concentration, tissue dehydration, urinary secretion is depressed, faeces are dehydrated, and no fluid is voided to the outside in any quantity it seems reasonable to assume that these changes are referable to the amount of fluid imprisoned in the stomach. This anhydraemia and consequent blood stagnation results in the circulatory disturbance which is the essential feature of the disease, and which is the direct cause of failure of the respiratory centre and death.

"The 'black-currant-jelly-like' appearance and swelling of the spleen is the result of that organ's natural function in acting as the chief repository for corpuscles in an attempt to alleviate this blood concentration and stagnation."

The opinion is expressed that the dry impaction of the large colon (so frequently described in grass disease) is not an essential factor in the causation of death, for in the mineral-fed horses which died of grass disease this condition did not exist.

The author is of opinion that susceptibility rests with the individual and states that "since the disease is seasonal, coinciding with a dietary change from winter feeding to young green cultivated pasture, and since its national distribution coincides with the areas with such winter conditions and pasturages and is nearly non-existent in natural pasture areas, it is felt that the disease is metabolic.

"From the fact that isolated cases occur throughout the year it seems that this metabolic upset can be reproduced by dietary measures other than green grass, but which stimulate the same gastro-intestinal condition."

The article also includes a description of the symptoms and the *post-mortem* findings.

The author concludes by expressing the feeling that larger doses of the mineral mixture should be fed over the complete stall-feeding period during next season and that at least 1,000 horses with controls should be used.

[**Clinical Observations on Trichophytosis in Dogs.** Witzigmann, J. (1937.) *Tierärztl. Rdsch.* **43.** 36. 596-599.]

Ringworm in dogs may assume one or more of the following types:—

(*a*) *Squamous form*—where the fungi growing in the epidermis cause a superficial inflammation with scanty exudation, producing circular bare patches with a thin covering of greyish scales.

(*b*) *Crustaceous form*—where the lesions have more pronounced scabs forming a firm, asbestos-like crust.

(*c*) *Deep type*—where the fungi growing in the hair follicles produce a folliculitis which not infrequently becomes purulent, due to secondary invasion with pyogenic bacteria. This form manifests itself usually on the cheeks and scalp by nodular swellings about 1 to 2 cm. in diameter which are covered with small grey scales and which when firmly pressed exude about half-a-teaspoonful of thin, watery pus. Where numerous, these boil-like swellings may cause the head to appear distorted.

The article describes two cases of ringworm in dachshunds, the first of which showed all three forms of the disease. The whole body was covered with lesions of the first two types, while the head and throat were covered with the boil-like swellings of type (*c*). The second dog had its body covered with bare patches of the squamous type. Both dogs were lively and showed little sign of itchiness.

Scrapings from numerous places in both animals showed branching mycelia but no spores. Attempts at cultural identification of the fungus were unsuccessful. It was found possible to transmit the disease to another dog but not to mice.

Both dogs were treated with a 4 per cent. solution of salicylic acid in spirit, followed by a proprietary chrysarobin-tar ointment. In the case of the boil-like swellings the pus was squeezed out daily before making the applications. When the lesions appeared to be cured they were treated for a few days with a cantharides preparation to stimulate the growth of hair. Both animals were discharged completely cured about a fortnight after the commencement of the treatment.

A. R.

* * * * *

[**Bovine Leucosis.** (Trans. title.) Footner, J. (1937.) *Bull. Off. internat. Epiz.* **14.** 329-344.]

Under this title Footner reviews a condition in cattle characterised by the appearance of whitish grey, soft tumours, which may be found in every part of the body. The disease occurs most commonly in Germany, east of the Elbe. There appears to have been an absolute increase in its incidence since the Great War. It usually occurs sporadically.

The most prominent symptom is the enlargement of the palpable lymph glands, particularly those of the head, the elbow, the knee cap, and the pelvic cavity. These tumours may attain the size of a man's head; they are circumscribed and freely movable. Their development is slow, taking weeks or months. With the development of the tumours the general condition of the animal becomes poorer, the skin becomes dry and harsh, the mucous membranes pale, the appetite is affected and the milk yield drops or even fails completely. The occurrence of the tumours internally may affect the digestive, circulatory or respiratory systems. Fever is usually absent. Cachexia and death are the final results. The blood picture shows a leucocytosis, up to 50,000 white corpuscles per c.mm., with a relative lymphocytosis varying between 70 per cent. and 99 per cent. of the total white cells. Immature lymphocytes are present.

On *post-mortem* examination, tumefactions of the lymph glands may be widespread. A "sarcomatous" circumscribed or diffuse proliferation in the myocardium is common. A submucous infiltration, nodular or diffuse, occurs frequently in the uterus or in the sub-peritoneal tissue. The liver and spleen do not show nodular lesions, but usually present a diffuse tumefaction. The kidneys show nodular lesions. Such lesions, varying in size from that of a lentil to that of a man's head, may occur in the skeletal muscles, the walls of the stomach and the adipose tissue throughout the body. Lesions may also be found in the brain.

The cause of the disease is not known, neither has any treatment been of value.

D. L. H.

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[The Dangers of Feeding Cod-liver Oil to Pigs. Tiedge, F. L. (1937.) *Deuts. tierärztl. Wschr.* **45**, 8, 132-133 (4 refs.).]

A fatal disease of young pigs is described, which is associated with the administration of cod-liver oil.

Symptoms occur after the oil has been fed for three to four weeks, and they comprise vomition, inappetence, lassitude, loss of equilibrium, cramp and dyspnoea. Autopsy shows widespread oedema and haemorrhages and acute degeneration and necrosis in the liver.

In many such cases, the oil was rancid, with a high fatty acid content. By the administration of such oil, the disease has been experimentally produced.

The exact toxic agent is not known.

E. W. A.

REVIEWS

[Vitamins in Theory and Practice. By Dr. Leslie Harris. Published by the Cambridge University Press. Price 8s. 6d. (second edition).]

Much has been written during recent years, both popularly and scientifically, on the subject of vitamins. Nevertheless, the less expert reader has had real difficulty in choosing a work suitable to his knowledge and at the same time reliable and devoid of extravagant claims. This want has certainly been filled by the publication of Dr. Harris' monograph as is eloquently testified by the early publication of a second edition.

The author has treated the subject in a living way and has devoted reasonable space to informative historical accounts of the growth of the subject in addition to explaining in concise language the present position of our knowledge. The recent comparatively rapid development of our knowledge on the true physiological function of some of the vitamins is given and it is clearly indicated how this knowledge is being gained subsequent to the successful isolation and/or synthesis of the pure vitamin. The unravelling of the complex history of the vitamins is indeed a fascinating story and that it should have been done so concisely and authoritatively as in this volume is a great boon to the reader and a great credit to the author.

Little reference is made directly to the effect of the absence of vitamins on domesticated animals, a fact which perhaps emphasises our still scanty knowledge on this subject, but in spite of this deficiency, the book can be truly recommended to those who have already learnt that our true function is just as much to prevent disease as to effect a cure.

* * * * *

[A Hundred Grand Nationals. By T. H. Bird. Published by Country Life, Ltd., 20, Covent Garden, London. Price, 15s.]

An historical account of what many consider is the greatest of all horse races.

The author pilots the reader over the course from the time of William Lynn, the innkeeper founder of the race, and of Duke, Mr. Sirdefield's chestnut gelding, which was ridden by the renowned Henry Potts and won the first National on March 1st, 1837, to 1937, when the race was won by Mr. Lloyd Thomas's Royal Mail with E. Williams up.

Mr. Lynn, who no doubt initiated the race in order to increase his own business, could have little dreamed that his race would survive for 100 years—and not only survive but so increase in popularity that it would attract competitors and spectators from both hemispheres.

Horses and men are described with an intimacy which could only come from one extremely well versed in racing lore. Scenes and episodes live again in the printed pages.

Although this great race was founded in 1837, it was not until the formation of the National Hunt Committee in 1863 that steeplechasing gained the complete confidence of the public. It is fitting that in the early years of the new era that grand old sportsman, the Earl of Coventry, should have won the Grand National with his two great mares, Emblem and Emblematic. The stories of the great equine heroes, Cloister, Manifesto and Jerry M, alone make the book worth reading.

To veterinary surgeons the references made to Captain Bennett and his gallant mount Sergeant Murphy, winner in 1923, must give particular pleasure. It is interesting to note that seven horses, including Old Joe, 1886, and Jerry M, 1912, failed to pass the "vet."

From start to finish the book is full of incident; it is well illustrated and worthy of a place in every horseman's library.

INNS FOR TOURISTS ON HORSEBACK

The Institute of the Horse and Pony Club, 66, Sloane Street, London, is dealing with requests from members for itineraries in many different parts of the country which will take them off the main roads and into quiet country lanes.

The Institute is also preparing a scheme for organising stabling accommodation for members' horses. Pictorial signs, indicating that stabling can be provided for at least three horses, are being sent to hotels and inns all over the country, after the accommodation has been inspected by officials of the Institute. A handbook, which will be issued to members shortly before Christmas, will give a list of more than 100 country inns already displaying the sign.

The sign shows, on a white background, a dark blue circle bearing the Institute's name in white letters and a light blue "cut-out" of the equestrian statue of George III in Cockspur Street.

* * * * *

The death of the last cab horse in Port-of-Spain has been reported to the Trinidad Society for the Prevention of Cruelty to Animals. The driver of the cab was charged with ill-using the horse, but was reprimanded and discharged by the city magistrate after evidence had been given that veterinary aid had been sought, but that, despite this, the animal had died.

N.V.M.A. BRANCH REPORT

Scottish Branch*

ANNUAL GENERAL MEETING

MAJOR J. G. MCGREGOR ELECTED PRESIDENT

The Annual General Meeting of the Scottish Branch was held in the North British Station Hotel, Glasgow, on Saturday, November 13th, 1937, at 2.45 p.m.

The President (Mr. H. Gillmor) occupied the chair and there were present Miss M. Delavoye, Professors W. Robb and W. M. Mitchell, Messrs. W. W. Peggie, J. Brown, R. M. Smith, W. Watt, Professor G. W. Weir, Messrs. A. Thomson, A. Young, H. F. Downie, W. Harley, W. Gardner, A. Spreull, junr., P. McIntyre, W. Nairn, J. Anderson, J. F. Taylor, D. Brown, R. Mitchell, R. G. Anderson, J. N. Ritchie, A. Sillars, J. MacFarlane, J. Gibson, Dr. W. S. Gordon, Messrs. S. J. Edwards, J. A. McKinnon, A. M. Grant, G. A. Sangster, M. H. W. Miller, A. P. Steele, Major J. G. McGregor, Messrs. D. Campbell, W. L. Weipers, J. McFarlane and the Hon. Secretary (Professor G. F. Boddie).

Before beginning the business of the meeting, Major J. G. McGregor drew the attention of the Branch to the exceptional circumstances of the day in that the Principals of both the Veterinary Colleges in Scotland were ill. He proposed that the Hon. Secretary be instructed to write to Dr. Bradley and Dr. Whitehouse telling them of the regret of the members of the Branch at hearing of their illnesses and conveying the good wishes of the Branch for a speedy recovery. The proposal was adopted.

The receipt was intimated of apologies for inability to attend from Dr. O. C. Bradley, Messrs. H. M. Wilson, W. Jackson Young, T. Bannatyne, A. M. McLeod, A. Gofton, W. Anderson (Keith), W. Anderson (Pittenweem), J. Grant, Major A. Baird, Messrs. D. Cumming, G. Howie, D. Weir, Dr. Whitehouse, Dr. J. R. Greig and Professor Linton.

The minutes of the meeting of January 16th, 1937, were read and approved.

Correspondence.—A letter from Dr. Bullock was read conveying to the Branch his thanks for the sum of £4 1s. 1d. collected at the Branch meeting of January 16th on behalf of the Victoria Veterinary Benevolent Fund.

Presidential Address

The PRESIDENT (Mr. H. Gillmor) delivered his Presidential Address. This address, which was cordially received, was as follows:—

I am deeply conscious of the great honour that was bestowed on me when I was accidentally appointed President of the Scottish Branch

*Received for publication November 30th, 1937.

of the N.V.M.A. I use the word "accidentally" for the following reason. Your Branch, in its anxiety to distribute honours, has decided that the different Divisions in Scotland shall nominate in rotation a President to hold office for one year. Then you kindly accept the individual whom a certain Division nominates. I think I was nominated from my Division simply because they thought I had more spare time than the other members. In theory the system should work excellently, for it should give the Branch some knowledge of how veterinary work is proceeding in different parts of the country.

Let me first of all express my very best thanks to what I might call your permanent staff for the help and guidance I have received from them during my year of office; in particular I wish to express my gratitude to the Secretary. Once seated in the Presidential chair this staff literally "holds you on" over every conceivable sort of obstacle that may come in the way. The thing that has impressed me most during the year is the amount of time and energy that these people sacrifice for the good of the profession. I must point out, however, that they are for the most part either professors in our colleges or whole-time officials who can, as a rule, conduct their work in a fairly regular fashion. The only excuse I can make for the practitioner's seeming inactivity is that he is at the beck and call of everyone and so has not much chance of arranging his spare time. After my experience here I will be very kindly disposed to the small proportion of the profession who, year after year, do their utmost to further our interests in every sphere of our work.

During my year of office I had the privilege to assist in giving evidence on your behalf before a committee on Veterinary Education appointed by the Ministry of Agriculture and the Secretary of State for Scotland. Here we learned how earnestly this committee is investigating the very important problem of how best the veterinary student should receive his training. Serving on the committee are two veterinary surgeons, whose intimate knowledge of the profession made our task much more simple. With the knowledge gained from the vast amount of evidence taken, I should imagine that the result of their deliberations would be a very fair index of what is required in veterinary education to-day.

The chief topic of conversation in the profession at present is the Government's centralised State Veterinary Service. It is rather peculiar that your last President should have so truly prophesied some service such as the one now proposed. He must have been studying the whole subject with the same vision and understanding that he would apply to a clinical case. Certainly, as events have transpired, his prognosis was in keeping with that of the expert clinician. I am full of sympathy for those whose duty it is to set this great scheme in motion and I am quite sure that every member of the profession will be required to give of his best if any appreciable headway is to be made in some of the eradication schemes that have been suggested. I must say at the outset that these schemes will be assured of success only when they are administered by all branches of the profession concerned working smoothly together as a single unit. I listened very intently to what the Minister of Agriculture had to say at the Bournemouth Congress and I must say that as a practitioner I came away a little disappointed with some of his remarks. If the practitioner is to look forward to an increase in work from cases observed by the whole-time officer on his rounds, I am afraid I am not altogether hopeful in this respect. I know only too well that farmers in our district need no expert to advise them as to when to call in their practitioner.

One great advantage of the new system is that we will at least have some standard of uniformity. At present we find in some areas that the practitioner is employed extensively in the tuberculin testing of cattle—in others his services are not recognised by the local authority. In addition to his ordinary clinical work one must remember that at present the practitioner spends a considerable portion of his time assisting his clients in the prevention and eradication of disease, so surely his experience should make him almost invaluable to this great undertaking. Does it not seem reasonable to assume that the scheme will have its maximum success when it fosters that personal relationship established between the farmer and his private veterinary surgeon? If it be decided that all the work should be done by whole-time officials then I can only classify the person who sets out to make a living at country practice as the complete optimist.

We hear a great deal to-day about the status of the profession and in the past Government authorities have recognised the valuable work done by certain sections of it, *e.g.*, the veterinary staff of the Ministry of Agriculture, the R.A.V.C. and those engaged in research work. I think our future status depends very largely on this scheme: we will rise or fall by the way in which we handle this very responsible adventure and, as I have said before, it is one which concerns every member of the profession. It is through our N.V.M.A. in England and our Scottish Branch here that the Government departments approach the profession, so I can only pass on the advice of past Presidents to all members of the profession—to join our National Association and to do everything in their power to further its interests.

Hon. Secretary's Report, 1936-37

The Hon. Secretary (Professor G. H. Boddie) now read his report on the activities of the Branch for the year 1936-37:—

During the period that has elapsed since that covered by my last report, there have been two general meetings of the Scottish Branch. During this period there have also been four meetings of the Council of the Branch and one special meeting of the Executive Committee of the Council.

The matters that have received the attention of the Council and its Executive Committee are as follows:—

Proposed State Veterinary Service.—The Executive Committee of the Council met the committee of the Scottish Society of Veterinary Officers immediately after the proposed State Veterinary Service was announced. The Council discussed the implications of the scheme at two of its meetings. The Hon. Secretary has kept in touch with the "National" offices in the matter. The appointment by the "National" of a consultative committee relieved the Scottish Branch of the need to consider taking direct action in the matter. The Scottish Branch is fortunate in being directly represented on the consultative committee through two of its members, namely, Mr. D. Campbell and Major J. G. McGregor.

Committee on Veterinary Education.—The Scottish Branch was invited to send two representatives to give evidence to this committee. The Council of the Branch was fortunate in securing the services of the President (Mr. H. Gillmor) and Mr. A. Gibson, Kirkcudbright. To assist these two gentlemen the Council discussed the lines along which their evidence might run.

Victoria Veterinary Benevolent Fund.—The first appeal to the Scottish Branch for support to this Fund through a collecting box met with a gratifying response which it is hoped will be maintained at future meetings.

Dalrymple-Champney's Prize.—The nomination by the Branch of Mr. F. T. Harvey for this prize in 1937 was approved by the Council of the "National."

N.V.M.A. Congress, 1938.—The Council of the Scottish Branch gave its support to the invitation to the "National" to hold the 1938 Congress in Glasgow.

Free Clinic, Glasgow Area.—The Council considered a remit from the Council of the "National" concerning the conduct of this clinic. It was decided that no action by the Branch was meantime necessary.

Restriction of the Sale of Tuberculin.—This matter, raised at the Annual General Meeting at Dumfries last year, was remitted by the Council to the "National" and is at present under consideration by the appropriate committee of that Council.

Council and Committee Meetings of the "National."—The arrangements made for the attendance of the Hon. Secretary of the Branch at the meetings of the Council and committees of the N.V.M.A. have proved of great value in maintaining co-operation between the parent association and its branch.

Methylated Spirits (Sale by Retail) Scotland Act, 1937.—The Council of the Scottish Branch, at the invitation of the Under-Secretary of State for Scotland, considered this Act and the Draft Order made under the terms of the Act. It was decided that there was no need for the Branch to take any active steps in the matter.

On the motion of Mr. A. Young, seconded by Professor Mitchell, the report was adopted.

Election of Office-Bearers

President.—The retiring President proposed as his successor in office Major J. G. McGregor, a member of the Scottish Metropolitan Division, whose turn it now was to provide the President of the Branch. Professor G. W. Weir seconded the proposal. Major McGregor being declared elected, the retiring President called upon Major McGregor to occupy the chair.

Major McGregor thanked the Branch for the honour paid him and expressed the hope that he would justify their choice. His first duty was the pleasant one of moving a vote of thanks to Major Gillmor for his services as President during the past year—both for the time and labour he had given to the Branch as President and also in connection with the evidence he had given on their behalf to the Veterinary Education Committee.

Mr. D. Campbell (President, N.V.M.A.) seconded Major McGregor's proposal and expressed his regret at not being able to reach the meeting in time to hear Major Gillmor's Presidential Address.

Hon. Secretary.—The President (Major J. G. McGregor) proposed that Professor Boddie continue in office as Hon. Secretary.

Mr. Watt having seconded, the appointment was agreed to.

Six Members of Council.—Mr. A. Thomson proposed and Mr. Gardner seconded the election of the former members, with the addition of one individual in place of Major McGregor, now President. This was agreed. Mr. Campbell proposed Mr. Young, Dumfries, for the vacancy, Mr. Nairn seconding. The election of Mr. Young was carried unanimously.

Mr. Alex. Main's Address

The President called upon Mr. Alex. Main, of the Department of Agriculture for Scotland, to deliver his address on the "Livestock Breeding Schemes Administered by the Department of Agriculture for Scotland."

Mr. Main, in a most interesting address which held the attention of his audience, described the

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activities of the department in the various schemes.

Professor Robb opened the discussion that followed, and the other speakers were: Messrs. J. Brown, J. Anderson, W. Nairn, Professor Mitchell, Major Gillmor, Messrs. D. Campbell, W. Watt, Dr. W. S. Gordon, Messrs. S. J. Edwards, W. Harley, J. McFarlane and W. W. Peggie.

The President summed up the discussion and called on Mr. Main to reply. In his reply, Mr. Main thanked the meeting for the reception given to his address and then replied to the points raised by the various speakers.

Professor Mitchell proposed a hearty vote of thanks to Mr. Main for his extremely interesting address. This was accorded with general enthusiasm.

Branch Representation Fund.—The President reminded the members of this fund and intimated that at the request of the Council he was continuing to act as Hon. Treasurer of the fund.

Any Other Business.—Mr. A. Spreull, junr., raised the point of his position as a whole-time officer of a municipality, whose duties were not largely connected with meat inspection, under the Centralised Veterinary Service. The President explained the position in regard to such veterinary officers and suggested that Mr. Spreull should consult the President of the "National" and himself, who were both members of the "National" Consultative Committee.

Vote of Thanks to Chairmen.—Mr. Nairn proposed a vote of thanks to the retiring President and the President for their services in the chair, this being duly accorded.

Geo. F. Boddie, *Hon. Secretary.*

N.V.M.A. DIVISIONAL REPORT

Eastern Counties V.M.A.*

MEETING AT IPSWICH

The autumn meeting of the above Association was held at the Crown and Anchor Hotel, Ipswich, on Friday, October 8th, 1937.

The President, H. V. Low, Esq., was in the Chair and there were also present: Messrs. M. Bray, D. Blyth, J. Buckingham, A. F. Castle, B. A. Claxton, W. H. Dennett, T. G. Heatley, S. E. Hill, H. J. Loveless, W. F. Loveless, G. T. Matthews, C. T. Murphy, C. C. Nesling, R. J. O'Neill, J. E. Porrett, H. Swann, H. P. Standley, Sen., W. Turtill, W. Waters, W. H. Wortley and H. P. Standley, Jun., (Hon. Secretary). Visitors present were Messrs. D. W. P. Bythell and G. Muir.

The minutes of the last meeting, as published in the *Veterinary Record*, were taken as read and signed.

Correspondence.—(1) From Messrs. H. Buckingham, Professor J. B. Buxton, Sir F. Hobday, A. J. James, E. Brayley Reynolds, F. Thurston and P. Welch, regretting their inability to attend the meeting.

(2) From Captain V. Boyle, tendering his resignation from the Society as he was abroad. It having been pointed out that Captain Boyle would soon be home again, the Secretary was requested to write him, stating that the members would rather leave over for the time being the matter of his resignation.

(3) From the N.V.M.A., containing the following resolution from the Royal Counties Division: "We, the members of the Royal Counties Veterinary Medical Association, in supporting the Attested Herd Scheme of 1937, approve the scale of fees laid down for remuneration of the veterinary practitioners by the Ministry of Agriculture and Fisheries, and are agreed that it is a fair scale of minimum fees to be charged for the testing of commercial herds."

After a short discussion, the meeting decided to give this resolution their unanimous support.

Election of New Member.—Mr. R. J. O'Neill, Ipswich, was elected to membership of the Association.

Film Demonstration.—Messrs. T. J. Smith and Nephew, Ltd., then kindly projected their three-part film dealing with the treatment of bone fractures in the dog and cat. Mr. J. Cochrane, in introducing the film, wished first of all to thank the Association for extending the invitation to them to show the film. The film was produced at the Beaumont Institute at the Royal Veterinary College, London, in collaboration with Professor Wright.

The President, in proposing a vote of thanks to Messrs. Smith and Nephew, said they had had a most interesting demonstration, and he felt that everybody, like himself, had considerably added to their knowledge from seeing the film. This was seconded by Major Heatley and carried with applause.

Mr. J. Cochrane made a suitable reply on behalf of Messrs. T. J. Smith and Nephew, Ltd., and said he hoped they would have some more films to show the members at a later date.

The President (Mr. H. V. Low) related an interesting series of clinical cases. [The reports of two of these, which had strychnine medication as their subject, are transferred to the Clinical Section of this issue, together with two cases by Major Heatley of obstruction by twigs and a case of urethral obstruction in a horse foal, presenting unusual features.—*Editor.*] Other cases were related by the President as follows:—

*Received for publication November 29th, 1937.

"The subject of my next case was a calf, badly blown after being choked: I could feel the obstruction half way down the oesophagus. I had just got the probang into his mouth when he went down. The pressure of the gas was manifested on the lungs and he stopped breathing; the bottom jaw dropped and the tongue protruded. This was no time for antiseptic surgery: I called to a man for a knife, stuck it into the rumen and liberated the gas. The calf showed no sign of life, but I started artificial respiration and after about 20 minutes got a very feeble gasp. Continuing these measures, eventually I got the calf on his feet, passed the probang and unchoked him. I expected that a large abscess would form at seat of puncture, but this did not occur and the calf did well.

"The last case I wish to relate was in a Pomeranian bitch. I was asked, by telephone, to go at once (twelve miles out) to see a valuable Pomeranian bitch which had a heart attack. As I drove into the yard, the owner came out with the words: 'You need not get out of your car; the bitch has been dead about five minutes.' However, I decided to see her and found that, to all outward appearances, the bitch was dead. I put my fingers on her ribs and could detect a very feeble heart-beat. I commenced artificial respiration and after about ten minutes I was rewarded with a slight gasp from the patient. I continued the treatment, and in about an hour the little animal was standing up on the table lapping milk. The owner informed me a little while ago that my 'miracle' dog has three puppies."

The meeting concluded with a hearty vote of thanks to the President for his efficiency in the Chair.

H. P. Standley, Jun., *Hon. Secretary.*

In Parliament

The following questions and answers have been recorded in the House of Commons recently:—

Foot-and-Mouth Disease

Sir G. Fox asked the Minister of Agriculture whether, in view of the fact that, when an outbreak of foot-and-mouth disease occurs in this country, the Ministry's officials demand that all vehicles coming near to an infected farm and the farmer's car, if he has one, shall be thoroughly disinfected, he will consider the desirability of insisting that all cars coming from the Continent, where foot-and-mouth disease exists, shall be subject to the same treatment as a safeguard against importing into this country the virus on the wheels or bodies; and whether, in any case, he will arrange that such cars shall be washed before being allowed to land in the country?

Mr. Ramsbotham: The requirement to which my hon. Friend refers in the first part of the question relates to vehicles leaving farm premises on which an outbreak of foot-and-mouth disease has occurred. Other vehicles coming near to an infected farm are not required to be disinfected since it is considered that the serious inconvenience which would result would not be justified by the slight risk involved. For similar reasons my right hon. Friend is unable to accept the suggestion in the last part of the question.

Mr. Short asked the Minister of Agriculture what action is being taken to investigate the theory that foot-and-mouth disease is being carried by birds from the Continent?

Mr. Ramsbotham: The theory that the present series of outbreaks of foot-and-mouth disease in the eastern and southern counties of England is to be attributed mainly to infection carried by mass migration of birds, is based on circumstantial evidence only. The Foot-and-Mouth Disease Research Committee now proposes to carry out a series of experiments to ascertain whether birds are susceptible to foot-and-mouth disease, or are capable of transmitting the virus mechanically.

Mr. Short asked the Minister of Agriculture the number of outbreaks of foot-and-mouth disease in America during the last five years?

Mr. Ramsbotham: No outbreaks of foot-and-mouth disease have been recorded in Canada or the United States of America during the last five years. My right hon. Friend has no precise information as to the extent of the existence of that disease in Central or South America.

Mr. Short: Can the hon. Member explain the freedom from this disease in America and Canada?

Mr. Ramsbotham: No, Sir, I do not think I can.

Mr. Short: Is the Department making inquiries in those countries?

Mr. Ramsbotham: I cannot give the information without making inquiries. I will let the hon. Member know.

Captain Gunston: Is it not likely that the freedom in America and Canada is due to the fact that they are much further from the Continent than are the British Isles?

At a later session, Sir G. Fox asked the Minister of Transport whether he can state the number of railway trucks of British or Continental origin which enter or re-enter this country from countries where foot-and-mouth disease exists; the manner of packing the goods in these trucks; and what regulations are enforced on re-entry to ensure rigid inspection of the material in which the goods are packed?

Mr. Burgin: I am informed by the railway companies concerned that the number of railway wagons which arrived in this country by the Dover-Dunkirk and Harwich-Zeebrugge train ferries during the month of October last was 1,870 and that the requirements of the Foot-and-Mouth Disease (Packing Materials) Orders, 1925 and 1926, are strictly complied with.

Sir G. Fox asked the Minister of Transport whether he will state the number of cars and other mechanically propelled vehicles carried by steamers from Continental countries during the month of October last; whether he is aware of the danger that foot-and-mouth infection may be carried by such vehicles; and what steps are taken to ensure that a thorough inspection is carried out of these cars on their re-entry into this country?

Mr. Burgin: During October last, 1,849 mechanically propelled vehicles entered this country from the Continent of Europe by the principal regular routes. My right hon. Friend the Minister of Agriculture informs me that he has no information indicating that foot-and-mouth infection may be carried by these vehicles and that no inspection of them, other than that of the Customs Officers, is required.

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examinations, December, 1937

LIST OF SUCCESSFUL CANDIDATES

Dublin

FIVE YEARS' COURSE.

First Year:

Bourke, S. J.	McConnell, J. W.
Burns, N. M.	McCrea, C. T.
Burns, T. F.	McFarland, M. J.
Farrelly, C.	McKnight, R. W.
Forgie, S. A.	Murray, H. P.
Good, N. S.	O'Reilly, H. L.
Hobson, J.	Parkhill, Miss M. E.
Hunter, W. M. D.	Singh, B. S. (C)
Kerr, K. R.	Timmins, E. H.
McClay, Miss M.	Wylie, M. A.

(C) Denotes credit in Chemistry.

Second Year:

Donohue, E. B.	Mukerjee, K.
Griffiths, O. V.	O'Kennedy, J. K.
Hewer, J. D. R.	Pritchard, R. W.
McCall, W. J. (P)	Ray, N.

(P) Denotes credit in Physiology.

Third Year:

Bennett, Wm.	Markham, T. F.
Drake, V. A.	Murphy, P. J. L.
Gallagher, M. A.	Sinnott, P. P.
Lawther, J. M.	

Fourth Year:

Anderson, R. J.	Kelly, B. J.

Fifth Year:

Cooper, P. J.

FOUR YEARS' COURSE.

Class C.

Captain, S. R.	O'Hagan, E.

Class D.

Douglas, W. M.	Drought, C. S.
Doyle, L. F.	Whitling, V. S. W.

Poultry Industry

Mr. De la Bere asked the Minister of Agriculture what steps the Government are taking to increase the research work in connection with the diseases of poultry and fowls, in view of the inexplicable cause of the death of fowls during the past few years which has been experienced by many poultry keepers?

Mr. Ramsbotham: I have been asked to reply. The Agricultural Research Council has been paying special attention to the serious losses from poultry disease during the past few years, and a committee of the Council was set up in November, 1932, to initiate research into fowl paralysis and coccidiosis, which are two of the major sources of losses. In addition, the Ministry's research staff at the Veterinary Laboratory, Weybridge, is being augmented by the appointment of two research workers who will be concerned exclusively with poultry diseases and an intensive programme of work is being put in hand.

Animal Management

Donohue, E. B.	McCall, W. J. (credit)
Fitzsimons, T. G.	Nayar, R. K.
(credit)	O'Kennedy, J. K.
Griffiths, O. V.	Power, W. P. (credit)
Mukerjee, K.	

Glasgow

FIVE YEARS' COURSE.

First Year:

Beatton, Miss M. C.	Jarvie, Thos.
*Brown, R. A.	Johnston, W. G.
Caldwell, W. A.	Loughlin, J.
Campbell, Miss D. G.	Mackay, Angus
Darroch, W. M.	Peoples, J.
Douglas, J. C.	Smith, Miss Doris
Evans, R. P.	Sutherland, W. R.
Gardner, D. D.	Taylor, J. M.
Grey, J. R.	Thomson, E. C. (C)

* Denotes Second Class Honours.
(C) Denotes credit in Chemistry.

Second Year:

Anderson, J. A.	McEvoy, B.
Baillie, Ian	Mackinnon, I. J.
Brown, James	Maclure, W. B.
(Glasgow)	Matheson, Archd.
Brownlee, W. A. D.	Monie, R. F.
Cairns, J. T. (P)	Nisbet, R. M.
Campbell, J. I.	Scott, Alex.
Chowdhary, B. N. S.	Steele, James
Ferguson, C. M.	Wilson, W. R.
Howatson, John	

(P) Denotes credit in Physiology.

Third Year:

Burton, Miss I. W.	Ogg, J. S.
Dayus, E. H.	Parker, Miss E. R. (A)
Donald, J. C.	Pettigrew, G. M.
Dunlop, Francis (H)	Qasuria, A. M.
Ferguson, Alistair	Rose, W. K.
Flynn, A. S.	Steel, D. B.
McCorkindale, James	Thomson, D. M.
Maclellan, Malcolm (A)	Tulloch, J. I.
Macleod, George	Weir, Miss M. B. A.
Melville, A. V.	

(A) Denotes credit in Anatomy.
(H) Denotes credit in Hygiene.

Fourth Year:

McCallum, A. M.	Smith, R. G.
Macdonald, John	Wyse, George (Paras.)
Mackinnon, W.	

(Paras.) Denotes credit in Parasitology.

Fifth Year:

Harrison, Thomas	Taylor, J. G.
Hunter, W. K.	Wharrier, John
Shinnie, Miss M. M.	Wilson, Andrew
Sime, Miss E. M.	Wilson, S. G.

FOUR YEARS' COURSE.

Class C.

Dunbar, G. M.	Meiklem, R. K.

Class D.

Forrest, Stewart	Marshall, James
Hall, R. B.	Nisbet, Alister
MacAllister, D. I.	Thomson, R. H.

(To be continued.)

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Dec. 20th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

Jan. 3rd, 1938.—Meetings of Committees, N.V.M.A., at 36, Gordon Square, W.C.1.

Jan. 4th, 1938.—Meetings of Council, N.V.M.A. and Committees, N.V.M.A., at 36, Gordon Square, W.C.1.

Aug. 21st-25th, 1938.—Thirteenth International Veterinary Congress, Zürich.

Aug. 26th-27th, 1938.—Thirteenth International Veterinary Congress, Interlaken.

Sept. 5th-9th, 1938.—Annual Congress, N.V.M.A., at Glasgow.

* * * * *

PERSONAL

Australian Government Tribute to the Late Dr. J. A. Gilruth

An experimental sheep-rearing station which is being set up at Cunnamulla, Queensland, by the Commonwealth Council for Scientific and Industrial Research, in collaboration with the Government of Queensland, and the Australian Wool Board, for research into the health and nutrition of sheep, is (states *The Scotsman*) to be given the name of Gilruth Plains, in memory of the late Dr. John A. Gilruth, a Scottish scientist who rendered valuable services to New Zealand and Australia in connection with investigations into agricultral problems and other matters.

Dr. Gilruth, who was the second son of the late Mr. Andrew Gilruth, farmer, Seaton of Auchmithie, Arbroath, was Chief of the Division of Animal Health, Commonwealth Council for Scientific and Industrial Research, from 1930 until his death in March last. He was appointed a Government Veterinarian to New Zealand in 1893, rising to the post of Chief Veterinarian in 1898. In 1901 he was appointed Pathologist to the Health Department of New Zealand, after having been made a member of the Royal Commission on the Public Health of New Zealand, set up a year earlier.

From 1908 to 1912 he was Professor of Veterinary Pathology and Director of the Research Institute, Melbourne University, and from 1912 to 1920 was an Administrator of the Northern Territory, Australia.

Services to Commonwealth

Almost continuously after his appointment as head of the Council's Division of Animal Health, Dr. Gilruth had urged the establishment of an experimental sheep station, pointing out its vital importance to the sheep and wool industry, and the decision to name the station after him was by way of tribute to his memory, and as a token of appreciation of the services he had rendered the Commonwealth.

The Australian Wool Board is financing the station to the extent of £17,500, and the Queensland Government has granted the promoters an area of 40,000 acres at a nominal rental.

The senior staff will consist of a research officer in charge and a manager. The research officer will be generally responsible, under the direction of the Chief of the Council's Division of Animal Health, for undertaking investigations into economic problems affecting the sheep industry. At the outset much attention will be given to the blowfly problem.

The manager will be responsible for the care of the stock, for the general maintenance of the property, and for recording observations on the sheep under experiment.

Dr. Gilruth was a brother of Lady Chapel, wife of Sir William Chapel, Arbroath, and of Dr. J. D. Gilruth, formerly of Arbroath and now resident in Edinburgh.

* * * * *

Marriage.—Elphick—Maclagan. At St. Mary's Church, Biggar, on December 4th, 1937, by the Rev. D. S. Rutherford, assisted by the Rev. John Maclagan, of Merrylee, Glasgow (uncle of the bride), Terence Bower, eldest son of Mr. and Mrs. Clement Elphick, of Newcastle-on-Tyne, to Eileen Ferguson, eldest daughter of Dr. and Mrs. P. A. Maclagan, Biggar.

* * * * *

R.C.V.S. OBITUARY

Webster, William, Craven House, Warminster, Wilts. Graduated New Edinburgh, December 21st, 1894. Died December 6th, 1937; aged 74 years.

Mr. Webster, a Lancashire man by birth, was well known in Wiltshire, having practised in Warminster for 40 years. For much of that time he had been a member of Warminster Branch of the National Farmers' Union. He was a past-Chairman of the Branch, and he had also represented the Branch on the county executive. Mr. Webster leaves a widow and five children. The sons are Mr. William M. Webster, veterinary lecturer at Massey Agricultural College, Palmerston, North Island, New Zealand; Mr. J. J. S. Webster, assistant dairy instructor to the Wilts County Council, and Mr. A. J. Webster, rating officer at Castle Donnington.

* * * * *

FOOT-AND-MOUTH DISEASE

Two further outbreaks of foot-and-mouth disease were confirmed in the Warminster district on Thursday of last week. Both outbreaks were on farms at Tytherington, where 250 animals were destroyed consequent on an outbreak on the previous Sunday.

On the same day a further outbreak of foot-and-mouth disease was confirmed at Stone cum Ebony, Kent. On the evening of that day it was announced that, in consequence of this outbreak and other cases, which have occurred previously in East Sussex, the Infected Areas Order in East Sussex and Kent has been replaced by a General Order covering almost the whole of East Sussex as well as those parts of Kent lying within a 15-mile radius of the infected premises at Stone cum Ebony.

Additional outbreaks in Dorset and Wiltshire have been confirmed this week.

* * * *

Support for Government Policy

Proposing a resolution of support for the Ministry in its policy of immediate slaughter of all affected and contact animals in outbreaks of foot-and-mouth disease at a meeting of the

Council of Agriculture for England, Sir Merrik Burrell, Chairman of the Royal Veterinary College, said there was much loose and irresponsible talk on the matter, and it was necessary to strengthen the Ministry's hands. On the Continent there was a policy of isolation and disinfection. There was an outbreak of foot-and-mouth disease in France at the end of May, and they had proceeded with their policy of isolation. What had happened? The figures since then were almost unbelievable. In Belgium there were 14,098 outbreaks during October; in France 32,808 in October and a further 22,655 outbreaks from November 1st to 15th; Germany had 1,952 in the first fortnight of November; and the Netherlands had 11,444 cases during September.

In our crowded country with our cattle and sheep population concentrated as it was, if we had not pursued our present policy our case would have been far worse.

The resolution was carried.

Mr. W. S. Morrison, Minister of Agriculture, said the Ministry depended largely on the willing co-operation of the agricultural community, and he had nothing but praise for the way in which farmers in the affected areas had been vigilant to report the outbreak and had put up with the restrictions which the policy necessarily involved. We were not out of the wood yet, but the results of the treatment of the outbreak had been very satisfactory. It was still necessary to exercise the greatest vigilance and to keep a strict eye on sheep. Any case of lameness in sheep should be reported at once.

A resolution congratulating the Government on the way they are tackling foot-and-mouth disease was passed at the annual meeting of the Smithfield Club.

Mr. W. J. Cumber, who moved the resolution, said it needed severe measures when they were dealing with a disease which might become rampant and devastating. He thought the club should record how much they supported the Government's policy of slaughter as the only way by which they could get rid of this fell disease.

Mr. J. J. Cridlan seconded, and referred to the ravages of the disease. It was agreed to send a copy of the resolution to the Government.

* * * * *

Colouring of Sheep

The National Sheep Breeders' Association, at their annual meeting, passed a similar resolution to that adopted by the Smithfield Club. A further resolution was passed recording agreement with affiliated societies with regard to the colouring and oiling of sheep and expressing the hope that show societies would make it a condition of entry that no sheep should be coloured or oiled.

* * * * *

CHEETAH VERSUS GREYHOUND

A dozen cheetahs were brought to England from Africa a year ago, and soon adapted themselves to the changed climatic conditions. They were tried out on tracks and soon took to racing, and at Romford Stadium on Saturday of last week the programme included three races in which the cheetahs took part. In the first, Helen, which has broken the track record in trials, met two dogs. In the second, James and Gussie met each other over hurdles, and in the third, Lewis attacked the 355 yards record. The cheetahs had been at Romford for a week, but because of the heavy state of the track they had not been able to practise.

Helen was taken in a special cage to the starting-point of the first race. She had a flying start and was nearly 50 yards ahead before the dogs left their traps. She rapidly increased the lead, seeming to bound over the ground with effortless ease. She covered the 265 yards in 15·86 seconds, compared with the dog record of 16·01 seconds.

Before the second race the announcer warned the spectators that if one of the cheetahs got ahead the other might give up the race, and that is what happened. Gussie got ahead, and James stopped half-way round the track and refused to finish the course. Gussie's time was 16·98 seconds.

In the last race Lewis failed to break the record for 355 yards. He went round the track in 23·10 seconds. Helen had previously done this distance in 19·8 seconds on a dry track. The record for a dog over the distance is 20·75 seconds.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

THE AGRICULTURE ACT, 1937, AND THE INTERESTS OF THE VETERINARY PROFESSION

To the Editor of the Veterinary Record

Sir,—May I congratulate Dr. Tom Hare upon so ably and succinctly expressing what are the thoughts of so many veterinary practitioners to-day.

I am very grateful to the Special Committee of the N.V.M.A. for the sacrifice of time involved in their duties in attending so many sessions during the negotiations with the Ministry of Agriculture and the worry thereby entailed. In view, however, of the information which is percolating through the agricultural journals one would appreciate a little authoritative statement in our own professional *Veterinary Record*. I quote from this week's *Farmers' Weekly*:* "It is proposed that the staff to be appointed on April 1st should be assisted by panels of part-time veterinary surgeons which will be reduced as the permanent staff is increased."

In view of the suggested minimum age, 23, is one to assume that future recruitment of whole-time officers will be made from assistants who have received post-graduate training and practical experience from the general practitioner, and upon the appointment of the recruit to the whole-time service a practitioner will thereupon lose his part-time appointment. Such a state of affairs is not compatible with the early speeches of the Minister of Agriculture on the Agriculture Act, 1937. I, personally, cannot conceive that this is the true attitude of the officials of the Ministry of Agriculture as my own personal professional relationships with these gentlemen have always been of the pleasantest and strictly ethical.

I have the honour to be, Sir,
Your obedient servant,
J. Cochrane-Dyet.

1, The Mount,
Malton,
Yorks.
December 14th, 1937.

To the Editor of the Veterinary Record

Sir,—As a corollary to your summing up of the proceedings to date of the "consultations" (page 1578 of the current *Veterinary Record*) between the Ministry of Agriculture and the N.V.M.A., I subscribe the scheme of the Ministry for the staffing of the Department of Animal Health, as recorded (my italics) in the *Farmers' Weekly*,* of December 12th, 1937.

"Five Hundred Vets. for the New State Service"

". . . Britain is to be divided into 78 divisions each in charge of a divisional inspector, and the divisions will be grouped into areas each in charge of a superintending inspector.

"Laboratory facilities will be provided in each division for the examination of milk samples under the Milk and Dairies Order and it is expected that provision will also be made for area laboratory facilities." (So far so good.)

"The Ministry have been in communication with county and borough authorities" (*not* the N.V.M.A.) "*on the staffing of the service* which will *at first* employ between 300 and 350 permanent whole time officers.

"In order to carry out the *whole* of the duties contemplated under the Agriculture Act a staff of 500 will be needed.

"It is proposed that the staff to be appointed on April 1st *should be assisted by panels of part-time veterinary surgeons which will be reduced as the permanent staff is increased.*" (Not quite so good and not at all what we expected.)

There it is—a *whole-time service* "cut and dried," and communicated not to the profession but to the outside Press—the paper in question is usually very well informed.

Yours faithfully,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn,
Gloucestershire.
December 15th, 1937.

*The information given in the *Farmers' Weekly* is reproduced in full, with editorial comment, on the "leader" page of this issue.—*Editor.*

* * * * *

THE USE OF CHLORAL HYDRATE AS AN ANAESTHETIC, ETC.

To the Editor of the Veterinary Record

Sir,—Having used chloral hydrate intravenously for a number of years as a hypnotic and anaesthetic for large animals, I am very much interested in Mr. Peck's solution containing sodium citrate in addition and I shall try it in the future. I have always used a 100 per cent. solution of chloral hydrate and have never had any bad results so far, but it is essential to ensure that the needle is in the vein and never leaves it during the injection.

As a reliable treatment for colic I can highly recommend it and in cases of suspected volvulus it would appear to me to be the only rational treatment, for nothing short of anaesthesia will produce complete relaxation of spasm, and any increase of motion or spasmodic contraction only serves to tighten the volvulus. Dosage varies with the size of the horse; using a 10 c.c. syringe, I give an initial injection of 10 c.c. (ml.) of the 100 per cent. solution, and leaving the needle in the vein I recharge the syringe and repeat as often as necessary—usually 25 to 30 c.c. (ml.) is enough, but I have given as much as 50 c.c. (ml.) to Shires, and some horses seem to be very resistant to the action of the drug. Always have the horse down if possible (*e.g.*, a colic case which is "up and down" frequently) when in a confined space as he will sway and stagger about to the grave danger of the attendants.

In large-animal practice chloral hydrate given intravenously is the counterpart to nembutal for small animals, capable of being given single-handed and producing almost instantaneous narcosis or anaesthesia as required with no more equipment than a 10 c.c. syringe, and it is equally useful for cattle.

I remain,
Yours faithfully,
G. S. Muir.

Avondale,
Trimley,
Ipswich.
December 8th, 1937.

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STARLINGS AND ROOKS AS CARRIERS IN FOOT-AND-MOUTH DISEASE

To the Editor of the Veterinary Record

Sir,—As so much has been written and said about migrant birds being responsible for foot-and-mouth disease outbreaks I am tempted to record the following for what it may be worth.

Some four years ago, as veterinary inspector to a local authority, I was sent to inspect a herd suspected of the above disease. There was no doubt as to its existence in both cattle and sheep: in the cattle a copious discharge of ropy saliva as well as foot lesions in both classes of the animals.

They were in a small field of some five acres, and no doubt the pasture was badly soiled by the discharges. The field was almost black with starlings and rooks—in "open order"—which reminded me of a regiment of infantry deployed to attack, which I often saw during my service in Africa during the Boer War.

Simply hundreds of the birds, but no further outbreaks of the disease.

Yours faithfully,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn,
Gloucestershire.
December 13th, 1937.

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VICTORIA VETERINARY BENEVOLENT FUND

Christmas Gifts Appeal

To the Editor of the Veterinary Record

Sir,—I am glad to be able to announce that I have received donations amounting to £31 5s. 0d. in response to my request for gifts to enable the fund to make special grants at Christmas to the most deserving of our recipients.

There is still time to add to this total if any member who intended to make a donation has forgotten it. Cheques or postal orders, made payable to me, will be acknowledged with gratitude.

Last year we distributed £61 0s. 0d., and we should be happy if we had the same amount, or more, again at our disposal.

Yours faithfully,
F. Bullock,
Secretary, Victoria Veterinary Benevolent Fund.

10, Red Lion Square,
W.C.1.
December 15th, 1937.